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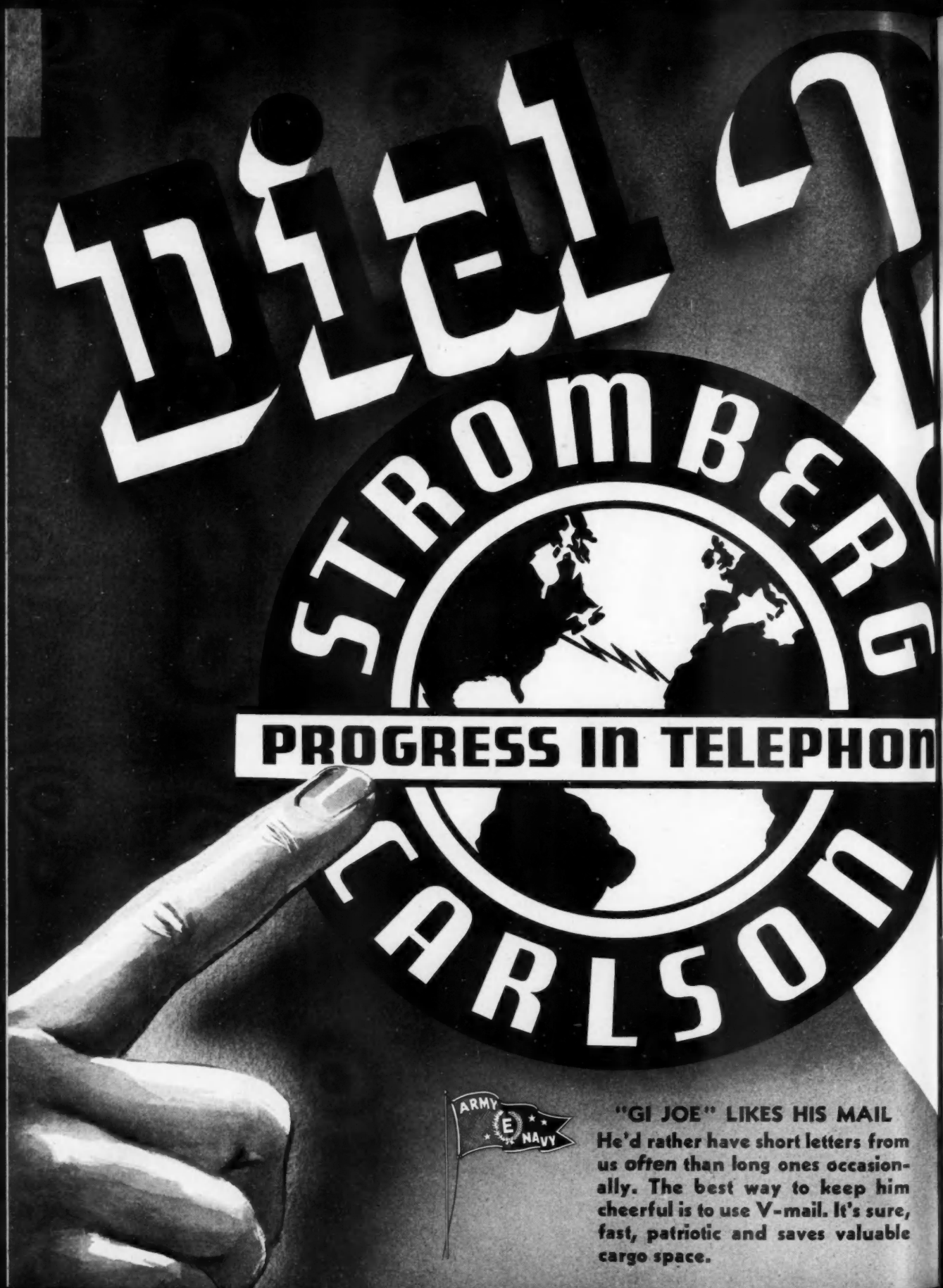
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TELEPHONY

The Journal of the Telephone Industry

MARCH 3, 1945

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ABC of the Telephone

By FRANK E. LEE

MODERN telephone instrument circuits are the result of almost 70 years' progress in the art of telephony. They are the result of cumulative developments carried on simultaneously by several manufacturers—in the laboratory and by actual use in the field.

To properly explain the operation of an instrument, it is necessary to describe the type of current or currents flowing in all or part of the circuit. Therefore, the first portion of this discussion will deal with these types of current.

PART VIII. Instrument Circuit Development. The seventh installment was published in the January 6 issue, page 9.

Direct Current

The meter in the circuit shown in *Fig. 1* indicates a steady current flowing through the resistance. On the left is shown a graphic picture of a steady

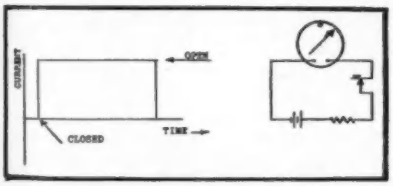


FIG. 1

direct current. The amount of current flow is indicated by the current flow line rising vertically from the zero line. The time interval is indicated by the current line moving to the right on a horizontal plane until the moment the push button is opened. Then the value of the current returns to zero.

Fluctuating Direct Current

When the diaphragm of a transmitter, through which a direct current is flowing, is moved steadily, the current flow graph would appear as shown in *Fig. 2*. Basically, the current is flowing in one direction. However, the action of the transmitter is alternately increasing and decreasing the resistance in the circuit. The amount of current flow fluctuates as indicated. Current of this type is called "fluctuating direct current."

Pulsating Direct Current

In another form, direct current is permitted to flow in a circuit at regular intervals. The revolving cam, shown in *Fig. 3*, opens the switch in the circuit four times in each revolution. The graph indicates that a current of uniform value is permitted to flow at predetermined intervals of time. A current of this type is essentially a direct current, but because it is interrupted at regular intervals it is known as interrupted direct current. Regular pulses of current flow in the circuit, hence the name pulsating direct current.

Alternating Current

An alternating current flows first in one direction in a circuit, then in the other. The graph in *Fig. 4* indicates an alternating current is flowing because the value of the current is measured above as well as below the zero line. The current starts from zero, builds up to its greatest value in one direction, returns to zero, and repeats

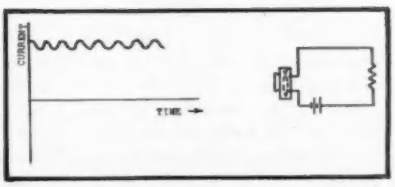


FIG. 2

the process in the opposite direction to make one complete cycle. A complete cycle is indicated in the graph.

Superimposed Current

It is possible to combine two sources of EMF in one circuit. The resulting current flow will produce effects having characteristics of both currents, yet unlike either separately. As an example, in *Fig. 5*, a battery is placed in a secondary or receiver circuit. The current flow of the battery is indicated by the dotted line on the graph. The battery creates the basic current in the circuit. When current is induced into the secondary winding of the coil an alternating current is present in the circuit.

Ordinarily, this alternating current would be graphed similar to the line shown along zero on the scale. In this

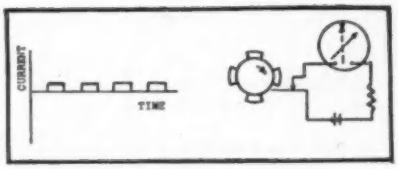


FIG. 3

case the alternating current does not change the direction of flow in the circuit. The alternating current effect is superimposed on the direct current. As a result, a chart of the two currents in combination is the heavy line placed over the dotted line on the graph. This type of current flow is called a superimposed current.

The different types of current flow just outlined require individual symbols in circuit or schematic drawings. Current flow direction is indicated by arrows. The specific type of current is shown by the style of the arrow used. *Table I* shows the various current flow

symbols and the current they represent.

The most important operating features of all instrument circuits is embodied in the simple circuit, *Fig. 6*, which represents the transmission of sound. This arrangement is a "one-way" system in which one party can only talk and the other can only listen. The transmitter varies the strength of the current flowing in the series circuit. The fluctuating strength of the magnetic field moves the receiver diaphragm. The receiver, connected to a source of direct battery, will soon lose its magnetic balance. A switch disconnects the battery when the circuit is not in use.

A logical step, *Fig. 7*, is a remedy for this one-way situation. It would be possible to build two simple circuits, place a receiver and transmitter at each end, and duplicate the equipment

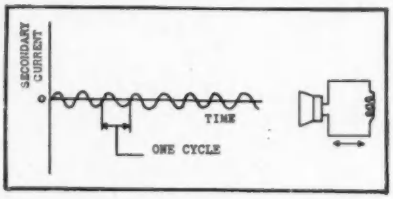


FIG. 4

entirely. During the early development of the telephone, ideas along this line were experimented with and actually placed in operation.

However, this proved to be a cumbersome system and further research developed a combination of the double circuit. *Fig. 8* shows the full series

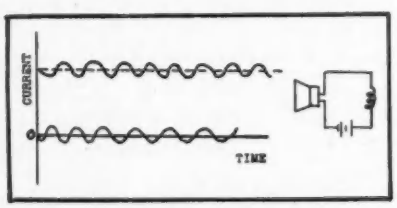


FIG. 5

circuit. It will be noted that in this circuit all the units are placed in series. The operation of either transmitter will set up variations in the current flowing through both receivers.

The full series circuit enables either station to send or receive a message. Also, only one pair of wires and a single battery supply is required. Again, a major disadvantage lies in

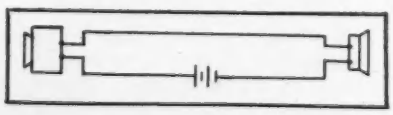


FIG. 6

Steady Direct Current	——— →
Alternating Current	←——→
Momentary Current	- - - - →
Direct Current (Momentarily greater than normal flow	——→
Direct Current (Momentarily less than normal flow	——→
Superimposed current	——→

TABLE 1

the receivers' being connected to a source of direct battery.

By using the principle of magnetic induction, it is possible to remove the receiver from the primary circuit and still perform the same function. In *Fig. 9*, the primary winding of the induction coil is inserted in the circuit in place of the receiver. The addition of the primary winding of the induction coil makes no appreciable change in the line or transmitter circuit.

Inasmuch as any change in the pri-

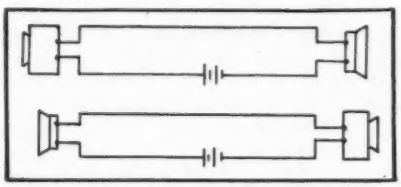


FIG. 7

mary winding of the induction coil will be induced into the secondary winding, the receiver can be placed in the secondary circuit, *Fig. 10*. The only current flowing through the receiver will be an induced alternating current. Because there is no source of direct battery in the secondary circuit, the receiver is in a "dry" circuit. With this arrangement the permanent magnetic field of the receiver will remain constant.

FIG. 8

Alternating current to operate the receiver is created by the induction coil. In *Fig. 11*, a condenser has been added in the secondary circuit to balance the self-inductance of the receiver coil windings. By using the proper condenser, current will flow in the secondary circuit as though neither capacitance nor self-inductance were present.

An improvement in transmission results is gained by placing the transmitter in both the primary and sec-

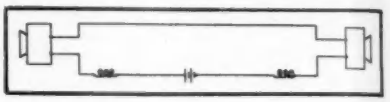


FIG. 9

ondary circuit, *Fig. 12*. Upon an examination it will be noted the condenser is connected across the terminals of the transmitter. As previously described, the condenser will charge and discharge as the resistance of the transmitter is varied. The result will be current flow in the secondary circuit through the secondary winding of the induction coil and the receiver.

The induction coil used in this circuit has approximately 1,400 turns in

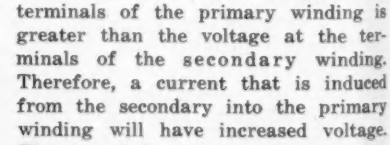


FIG. 10

the primary winding, and 1,100 turns in the secondary. The voltage at the terminals of the primary winding is greater than the voltage at the terminals of the secondary winding. Therefore, a current that is induced from the secondary into the primary winding will have increased voltage. This is called a "boosting" effect. The increase in voltage means the circuit will be effective through more line wire

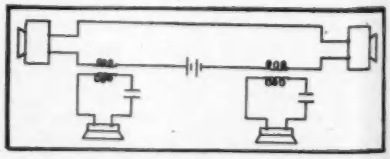


FIG. 11

resistance, which makes possible the use of longer line loops from the central office.

The induction coil windings are wound in the same direction on the iron core, but are reversed to each other at the terminals. By reversing the windings, the condenser oscillations boosted through the induction coil windings are coordinated with the operation of the transmitter. When the transmitter diaphragm moves to decrease resistance in the primary circuit, causing an increase in current flow, the boosted current from the condenser is in a direction to add to or increase the normal current flow.

For the same reason, when the transmitter is moving to reduce the current flow in the primary circuit, the current from the condenser boost is in a direction to further oppose the flow of current in the primary circuit.

It has been shown that more than one current can flow—in opposite directions—in a given circuit or portion of a circuit at the same time. The two currents offer no actual physical aid or opposition to each other, yet, the effects they produce will reflect either aid or opposition. Consider for a moment the condenser boost described above. When the boost is in a direction to increase the normal flow of current, the magnetic field set up by the distant or receiving station induction coil is strengthened. Also, when the boost is in a direction opposite to the normal line current flow, the magnetic field created by the normal line current (being reduced by the sending transmitter at this time) is further reduced by the opposing magnetic field created by the boosted condenser current. The incoming signal is induced into the secondary circuit in the same manner as in circuits such as in *Fig. 11* previously described.

Again, the circuit shown in *Fig. 12*, theoretically, offers increased transmission results as compared with the preceding circuits. Its shortcomings are proved in actual use. The oscillating current (set up by the condenser charging and discharging with the operation of the transmitter) flows through the associate receiver. The receiver reproduces all of the sounds that strike the transmitter. This effect is termed "sidetone."

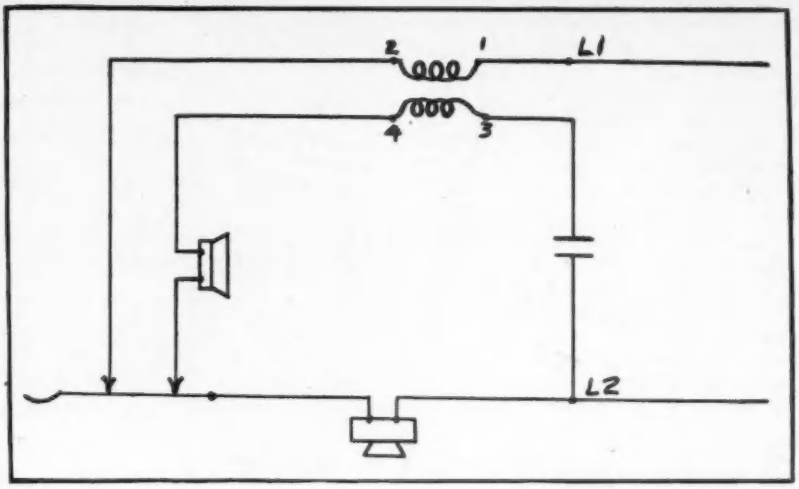


FIG. 12

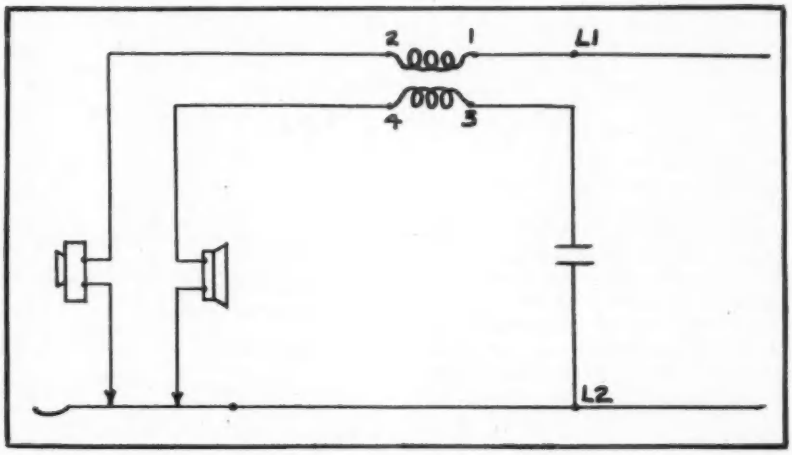


FIG. 13

Sidetone allows room noise to be reproduced in the receiver to interfere with the incoming signal. Also, the user of the circuit, hearing his own speech reproduced loudly in his receiver, unconsciously lowers his voice. This may seriously affect outgoing transmission.

It is possible to reduce the sidetone to some extent by removing the transmitter from the secondary circuit, *Fig. 13*. In this circuit the aim to reduce the appreciable sidetone has been accomplished to some extent. However, sending or outgoing transmission loss has been increased because the condenser boost is lost. The transmitter, when operating in this circuit does not affect the condenser which is in another circuit. This circuit is known as a reduced sidetone circuit. The use of this circuit should be restricted to only those cases where excessive sidetone is experienced.

Circuits have been designed to eliminate sidetone, and, at the same time, to retain the transmitting efficiency of the sidetone circuit. A discussion of these circuits will be covered in the next installment.

(To Be Continued)

Telephone Monologue

I am a telephone. While I am not broke, I am in the hands of a receiver. I have a mouthpiece, but unlike women, I never use it. Fellows use me to make their dates with girls, and girls use me to break said dates. Husbands call up their wives over me, and wives call their husbands down over me. I never get to call anywhere, but sometimes the company comes and takes me out. I am not a bee, but I often buzz. I am the "bell" of the town, and while I do not wear jewelry, I often get rings.—*Crosstalk.*

BY FRANCIS X. WELCH

TELEPHONY'S Washington Editor

House bill provides federal loans to small business. . . . REA co-op association gathers data on rural telephony as result of Hill Bill. . . . Senate discusses international communications merger. . . . Racing ban releases telephones and circuits. . . . FCC holds radio allocation hearings.

LAST WEEK in this department mention was made of the availability of loans to cooperative telephone companies by the Agriculture Department. Somewhat along the same line, but not yet enacted into law, is the program of the Small Business Committee of the House of Representatives.

On January 18 the House of Representatives approved a resolution (H. R. 64) to set up a select committee to study the problems of small business, with particular reference to the following:

(1) Whether the potentials of small business are being adequately developed and utilized.

(2) Whether adequate consideration is being given to the needs of small business engaged in non-war activities.

(3) Whether small business is being treated fairly and the public welfare properly and justly served through the allotment of materials and in the granting of preferences in the sale of materials.

(4) The need of a sound program for the solution of postwar problems of small business.

The committee (for the present session of Congress) was placed under the chairmanship of Rep. Wright Patman (D., Tex.). So far, no legislation has been recommended, but the special House committee is interested in a number of proposals, including one sponsored by former Rep. Maury Maverick of Texas, who is now an official of the War Production Board, especially interested in the fate of small business enterprises under the war program. Mr. Maverick, it is understood, would like to set up a "little RFC" for small business, making credit available at low interest rates to small commercial companies so they can bridge the difficult economic transition from war to peace and provide jobs for the returning veterans.

Representative Robsion (R., Ky.), speaking in favor of the resolution to continue the Patman committee (which last year was engaged principally in trying to secure an adequate allotment of war contracts for small business plants), addressed the House of Representatives on January 18. He said in part:

"We have been told that in order to maintain our high level of prosperity and income, there must be provided 60,000,000 jobs after the war. We must depend upon nearly 3,000,000 so-called small business concerns of the nation to provide a large majority of these jobs, and, furthermore the destruction of small business and the concentration of capital and power in few great business concerns carry a real threat to our free institutions.

"In a representative democracy private enterprise has been and must continue to be the foundation rock. Nothing can contribute more to the freedom and liberty of the American people than to have a prosperous private enterprise with management and workers distributed in millions of small business concerns rather than concentrated in a few very large enterprises. These millions of small, free, private enterprises are a real protection to the American people against large monopolies. The small business concerns must receive proper protection, encouragement and help."

Incidentally, honorably discharged veterans already have certain rights to borrow money from the federal government under the so-called GI Bill of Rights, which was enacted into law last year. However, the veteran, under such circumstances, must have a proprietory interest in the business to be set up or expanded, in order to qualify for a loan. It is doubtful whether under these restrictions the lending authority

under the GI Bill of Rights would be of much assistance to small telephone companies seeking to rehabilitate their plant, unless a returning veteran had a substantial, if not controlling, interest in the business.

* * *

The National Rural Electric Cooperative Association, which is the "trade association," so to speak, of the REA co-ops all over the country, has become interested in the proposed legislation now pending in Congress to provide for federal financing of rural telephone service, as exemplified in the Hill Bill. On January 15 the NRECA sent out a questionnaire not only to its own members but all REA co-ops, asking specific information on the available quality, cost, etc., of rural telephone service. The NRECA covering letter referred to the Hill Bill by name and the fact that "it proposed to authorize the advancement of federal funds to the REA (among other borrowers) for possible use in financing the expansion or improvement of rural telephone service."

The NRECA asked the REA co-ops to fill out and return promptly (after polling their consumer membership) the following information:

(1) The number of rural electric consumers having telephones.
(2) Type of ownership — whether Bell, Independent, or co-op.
(3) Grade of telephone service.
(4) Basic monthly telephone charge.
(5) Availability of extension of telephone lines without line charge to consumers not having a telephone.
(6) Number of consumers desiring telephone service from their REA co-op.

NRECA headquarters here in Washington say that most of the information sought has been received and is now in the process of being collated, classified, and analyzed. The apparent purpose of the NRECA in accumulating such data is doubtless to assist congressional committees to get a picture of the nation's rural telephone needs when and if the Hill-Patrick bills and the Poage Bill—all proposing federal financing for rural telephony—come up for hearing. At this writing, all these bills were more or less in the quiescent stage, due to the fact that the appropriate committees on both sides of Congress were otherwise engaged in the consideration of very pressing matters.

On the Senate side, the Agriculture Committee continued to be engrossed with REA troubles and the naming of an administrator to succeed Harry Slattery, who resigned last November. In the House Interstate Foreign Commerce Committee, a flock of regulatory legislation, including bills to amend the Communications Act, promised to keep that body engaged right up until the summer recess.

"Look, Fred, she likes me."
(Courtesy "Pictorial Review," CHICAGO HERALD AMERICAN)

* * *

An Arizona Democrat, Senator McFarland, took the Senate floor on Washington's birthday to outline the forthcoming program of the Senate Interstate Commerce Committee in studying the proposed merger of American international communication interests. Senator McFarland, who had been named by Chairman Wheeler of the Senate Commerce Committee to handle the important merger study, promised early action on various plans for bringing about satisfactory merger legislation. The views of various government departments, the Army, the Navy, the Federal Communications Commission, and the State Department, will be obtained in a series of hearings likely to commence early in March. Even the views of the White House may be made known to the sub-committee through a special message voiced by a presidential aide.

Senator McFarland, in discussing the international communications policy of the United States, in his address to the Senate on February 22, stressed the unanimity of opinion that "something must be done" to improve the American international communications setup. He observed that the government departments, including the military, had been giving increased attention to the proposition that eventually there will have to be a "single integrated American communications company engaged in overseas or international traffic."

One responsibility of the Senate subcommittee, referred to by McFarland, is the job of assessing the "ultimate use" of the vast amount of communications equipment and facilities now being used by the Army and Navy and which will have to be paid for by the American taxpayer. He hinted that some of our Allies might not be very willing to hand back to us such equipment now being used in their territorial areas, even though we may need it for expanding military operations.

Senator McFarland expressed some concern and added his thought that the Army and Navy were also concerned—over the possibility of the American military communications system being turned over to a "third-rate" American international communications organization — its strength dissipated among competitive commercial companies. He pointed out that since Pearl Harbor the Army and Navy have labored mightily to bring into existence "an empire made up in part of the facilities of our commercial companies, and in greater part by an entirely new system —the biggest communications system in the world, but run by the Army and Navy."

* * *

Previous to Senator McFarland's address, two other members of the upper chamber had discussed the vast network of communications facilities installed by the American armed forces throughout the world. They were Senator Burton, Republican of Ohio, and Senator Tunnell, Democrat of Delaware, members of a sub-committee of the Senate War Investigating Committee, who recently inspected military installations in the Mediterranean area. Senator Burton pointed out that the Office of War Information operates a radio station in Algiers which cost over a million and a quarter dollars and that the French government has already shown its desire to get control of this station — preferably through lend-lease. Burton said that such communication facilities, not only in French North Africa but in the Middle East might be a valuable experimental test for a more vigorous United States communications policy in the postwar period.

Senator Tunnell likewise believed that the Algierian station presented an opportunity to this nation to use it as a valuable radio terminal. It would free American users of international communications from the present and prewar monopolistic setup of international wireless and cable facilities.

* * *

Paul A. Porter, chairman of the Federal Communications Commission, informed War Mobilization Director James F. Byrnes recently that the shutdown of the race tracks on January 3 had made available for essential use

19,000 miles of leased wire circuits, with 700 extensions, previously used for dissemination of racing information.

Chairman Porter, who also is head of the Board of War Communications, said that large numbers of telephone sets were being reclaimed which will assist in alleviating the shortage of instruments. He pointed out that the telephone industry has orders for service awaiting fulfillment because of shortage of either telephone instruments or central exchange equipment.

The manpower involved in the maintenance and use of the leased wires has also been made available for essential work, Mr. Porter reported. He said that at the same time Western Union was taking out the racing information networks, the telephone industry was taking steps to recover the "large number" of telephones used locally to handle racing information and bookmaking. He said this would alleviate in the near future the backlog of 1,500,000 orders for telephone installations.

* * *

The Federal Communications Commission on February 20 ordered an investigation into the "apparent need for interstate and foreign telephone long-distance service in the area of Maryville (Nodaway County), Missouri." The proceeding will determine whether a physical connection should be required between the facilities of the Bell System (Southwestern Bell Telephone Co.) and the Peoples Telephone Exchange, Inc., or the Hanamo Telephone Co. It was understood that the Peoples Telephone Exchange formerly was a mutual company, which was incorporated as a commercial company in 1941 and sought a certificate from the Missouri Public Service Commission to operate, which request was denied.

The Hanamo Telephone Co. is a commercial company and is interested in preventing the Peoples Telephone Exchange from obtaining the operating certificate. The certificate case is now before the Missouri state courts. Southwestern Bell has indicated its willingness to give a toll connection to the Peoples Exchange upon its qualifying as an operating utility authorized to do business in the form of the certificate issued by the Missouri Public Service Commission.

* * *

Extra pay for imported telephone employes has been curbed. The special telephone panel of the National War Labor Board recently recommended that the Ohio Bell Telephone Company should end by May 15 its practice of paying living expenses of telephone operators transferred to Dayton and other "labor-tight" Ohio cities. The practice was the main cause of the Thanksgiving Day strike last year which tied up long distance service in Dayton, Cleveland, Washington, and other cities when affiliated members of the National Federation of Telephone Workers walked out in protest. The panel report, which was a 2-to-1 decision, said that the additional pay for the extra living expenses for workers imported to given communities "caused unrest, disharmony, inefficiency, and work stoppage."

As an alternative, the panel suggested that where future conditions necessitate the transfer of workers from their home exchanges to other points, terms should be agreed upon in advance between the company and the union. It further recommended that the transfer question be incorporated in the present company-union contract. As a temporary measure, in Dayton, Ohio—main trouble spot — a longer work-day for native operators was suggested.

* * *

Oral arguments on the proposed allocation of radio frequencies by the Federal Communications Commission were scheduled to commence February 28. Briefs filed by the American Telephone & Telegraph Co., the United States Independent Telephone Association, and five Independent telephone companies of the Gary group, asked the FCC to revise its tentative allocations so as to allow sharing on fixed public service circuits of radio frequencies for use only by other so-called "common carrier" (commercial communication companies) services. This was tantamount to seeking the allocation of certain frequencies for the exclusive use of the telephone industry.

The tentative FCC allocations already announced would require telephone companies to share such frequencies with various other non-carrier services. The brief of the AT&T was filed by its general attorney, T. Brook Price, in association with Edmund S. Hawley. The USITA brief was filed by its executive vice president, Clyde S. Bailey. The Washington and San Francisco law firm of Wheat and May submitted the briefs for the Gary companies.

Incidentally, use and progress being made with the experimental licenses obtained by the Bell System from the FCC were described in interesting fashion by President Walter S. Gifford in his recent annual report to the stockholders of the American Telephone & Telegraph Co. He said that engineers of the AT&T have been experimenting with these extremely short waves on the theory that they may supplement and may perhaps even replace wires and cables for certain functions in the business of telephone and television transmission.

"These very short waves can be formed into beams like searchlight beams, and can penetrate darkness, fog, dust and rain," Mr Gifford said. To protect them along the earth's surface beyond the horizon, however, he said, relay stations must be employed, but there is no static and the number of speech channels in this frequency range is almost limitless.

"While the communications possibilities of microwaves still await final proof and economic evaluation," said Mr. Gifford, "they appear very promising and their use is being explored as a supplement or alternative to wires and cables for telephone and television transmission."

Mr. Gifford recalled that the company had obtained licenses from the FCC to test a radio relay system between New York and Boston. Intermediate relay sites already had been obtained, he said, and the construction will be pressed as soon as war conditions permit and manpower and materials are available.

With proper development, Mr. Gifford indicated these microwaves may be used for communication service with trucks, busses, and all sorts of automotive vehicles in cities or on distant highways, and with farmers in remote areas. It will be of great use in reaching communities where wire service has been cut off through storm or disaster, he added.

It should not be imagined, however, it was explained by another company official, that this new instrument, when finally tested and harnessed, will immediately replace the presently wired telephones. It would be useful, though, for supplementing the present service to reach remote areas more readily through central receiving stations which could be hooked up with telephones in these areas. It also would offer wider facilities for sound and television programs.

>> According to the *New Yorker* magazine, a Brooklyn man, while waiting at the telephone for the Information operator to look up a number for him, sneezed. Whereupon "Information" promptly said, "Gesundheit!"

From Magneto to Dial

By H. A. BROWN
Secretary-Treasurer
Griggs County Telephone Co.
Cooperstown, N. D.

This is a story of how the progressive management of a small family-sized Independent telephone company improved its financial and operating status by applying modern and up-to-date equipment and methods. Address given before the recent Minnesota telephone association.

FIRST I want to give you a little history of our company. It was started about 1900 by two brothers who secured a franchise in Cooperstown, N. D. About 1907 some of the local business men were taken into the company, and it was reorganized into a corporation and was called the Griggs County Telephone Co. with headquarters in Cooperstown, a county seat town with a city form of government. Cooperstown had a population of about 950 at that time. A new magneto switchboard was installed. The Northwestern Bell had brought in a toll line from Valley City. Later an exchange was started in the village of Binford, a town of about 250 population. Still later the McHenry exchange was taken over. Binford is about 20 miles northwest of Cooperstown, and McHenry about 12 miles west of Binford. That is the Griggs County Telephone Co. I am telling you about today. Our rates in 1907 were $1.50 per month for residence, $2.00 per month for business, $15 per year in advance for rural, and $6.00 per year in advance for switched, farmer-owned lines. (All rural lines were ground lines the same as today.)

In 1913 the writer and his wife came into the picture as managers. The writer had worked as helper and lineman for three years before that time. Right after World War I we found the sheriff was about to catch up to us, so we had to apply to the North Dakota Public Service Commission for a general rate increase. We also requested a toll charge between our exchanges. After several commission hearings and a property appraisal, we were granted the following increased rates and toll between exchanges: Cooperstown, residence net per month, $2.00, business net per month, $3.25, rural net per month, $2.00, with no change in the switching fee—all billing at 25 cents per month higher with discount if paid by the 15th of the month.

We had plenty of opposition to this increase. At Binford the rates allowed were $1.75 net for residence; business, $3.00 net per month; rural, the same as Cooperstown. We lost some business by putting into effect this increase, but later some of it was resumed. To satisfy the farmers at Binford we had to sell them the farm lines and switch for them. They let the lines run themselves, forgot to pay their switching fee and taxes, and just naturally went out of business. Later we got one line going again with 15 telephones on the line, and it is now going along all right. At Cooperstown the farmer-owned lines fared better, for they ran their business as any business should be run, and are still giving service. We also have learned that we must assist these farmer-owned lines. We order supplies for them and keep them on hand at all times. We persuaded them to secure sleeve tools so they could make better splices. We even convinced a couple of them to get an ohmmeter and a good handset.

H. A. BROWN

In 1932 the depression hit us with a bang, and wheat went down to 20 cents a bushel. You understand what that did to our business between 1932 and 1938, as our territory is strictly agricultural. But this depression did have somewhat of a silver lining. It taught those who stuck through that they must diversify their operation.

About this time our son, Gordon, came into the picture, having finished his education, with telephone in his blood and with plenty of pep and new ideas. At one of the Minnesota telephone conventions, we were shown a dial switchboard for small exchanges. We decided that we would try to put one of them in our Binford exchange, and if that worked out satisfactorily, we would see what we could do about cutting over the Cooperstown exchange. The Binford exchange had about 15 local and 18 rural telephones at that time, with an agent operator. We took our problem to an old friend who had been with our company right after World War I who was in a position to assist us in financing and engineering.

We decided on a 50-line dial board, with 30 lines equipped, one trunk line to Cooperstown, five adapters for

ground lines, and five subscribers' conversations at any one time.

We knew we must have an increase in rates to make this pay, and our experience in 1920 had proved to us that our public relations were not what they should be. We then made a personal canvass of our subscribers and secured their approval to the conversion, so when it came up before the public service commission, it was without opposition. We were granted a net increase of 25 cents for residence and business, making a net residence rate of $2.00 and a net business rate of $3.25, with the rural and switching rates remaining the same.

We cut the new dial board into service in May, 1940, with Gordon doing the installation work. We owned our own building at Binford, a cement block building on main street, where we put the equipment. We put in all new common battery dial telephones in town, and cut over our rural by converting the old magneto telephone to dial operation. That was our first mistake, for without listening keys in the switchhook, the automatic ringing did not do much good, for people on a party line must keep up with the news. When a receiver came off the hook, the ringing would stop, so if the dialing party did not get his call through on the first ring or so, he would have to hang up and start all over again. This condition was later corrected by putting in common battery dial wall telephones with listening keys attached. This cutover was made line by line.

Right here I would like to make this remark. This unattended dial office is in its fourth winter without heat in the building, and it is working O.K., but I think we should have a small electric heater with some sort of thermostatic control to keep the building just above freezing. This would not cost much in a small room. I have been in this building when the temperature was 26 degrees below zero, and I do not need to tell you how efficient the battery is at such a low temperature.

This change in service was very well received by our patrons right from the start, with its better talking qualities, automatic ringing, and secret town service. About the only thing that was missed was, as Fibber McGee says, "Is that you, Myrt?" From the 15 local lines in town we have now filled up the 30 equipped lines, and two lines of divided ringing two-party, and have three on the list waiting for the time when new telephones are available. When we filed our rates, we requested that when our equipment became filled, we be allowed to put in two-party lines,

CAPT. GORDON H. BROWN

divided ringing at the same rate. We have no party line rates in town.

This small dial installation worked out so well, we got busy to see what we could do about cutting Cooperstown over to dial operation. Our local newspaper had been very kind to us with news stories about our Binford cutover, and gave us a nice story about what we wanted to do in Cooperstown. After estimating our costs, we approached the mayor, putting our cards on the table about what we would like to do, our proposed rates, costs, etc. He gave his consent. We then contacted the rest of the city council, then the county commissioners. The chairman of the commission was a merchant in Binford, making the remark that "if this is like what you did in Binford, it will be a fine thing." The auditor was instructed to sign the petition we had prepared to present to the state public service commission. We then contacted our local subscribers and very few refused to sign for the conversion. The public service commission held a hearing in Cooperstown. The mayor and one woman subscriber attended the hearing—the mayor at our request. The lady would not go on the stand, but told the commissioner off the record that she could not pay more for her telephone service, but that she wanted to keep the service. She paid the increase and remained a subscriber.

The commission granted our request for a 50-cent increase in both residence and business rates, where new telephones were installed and a 25-cent increase in the resident rate where subscribers were willing to have their old magneto telephones cut-over to dial operation. We estimated we would have at least 20 of these subscribers, but when the cut-over was completed we found there were only two old telephones in service. That made our rates in Cooperstown $2.50 net for residence and $3.75 net for business. The $2.00 rural and switching rate was not changed as it was hoped that we could fill our present company-owned rural lines, for the farmers were just starting to put back their telephones after the depression.

Our outside plant in Cooperstown was in fair shape. We had put in underground cable to cover most of the town, and we had enough cable pairs to take care of a town of three times the size of Cooperstown. Population was now about 1,100. We had rented quarters in Cooperstown, so we had to find a lot in the center part of town to house the equipment. After this was done, we had only to half tap our present cable plant and move about 200 feet to a new location. We built a modern office building as nearly fireproof as possible facing the main street. We had often noticed that some companies which had put in dial exchanges had placed their buildings on the back of a lot facing the alley, among the rest of the outbuildings, as if they were not sure whether they were proud of being in the telephone business. We are happy and proud of the fact that we are able to give the community telephone service, and want the public to know it, and the writer does not know of any better way to keep the public reminded of this, than a nice building on the main street with the word "Telephone" in big letters across the front.

We again called on our old friend, and had him work out the conversion plan. We had about 160 local telephones at this time, six company-owned farm lines and nine farmer-owned lines. We decided to install a 300-line dial board and have 200 lines equipped at this time, 20 ground line adapters, and arrangements for 20 conversations at any one time, three trunks for toll to Valley City, two of these equipped now, one for Binford and McHenry toll, and one for Finley and Lakota toll, Valley City and Lakota are Northwestern Bell toll checking centers for connecting companies, and Finley is a Bell dial exchange. An attendant's cabinet was to be installed in our home, to take care of local toll and information calls, the home being about 1,000 feet away from the equipment office. This was done by putting in a 19-gauge cable, 25 per underground. The equipment arrived in December, 1941, and Gordon proceeded to install it. He had spent about eight weeks in the factory when it was being tested for shipment.

About January 15, we started to install the telephones, line by line, putting in several trunks between the old

(Please turn to page 41)

BRITISH PUBLICATION TELLS ABOUT RADAR

THE WONDER weapon of World War II, radar, carefully guarded secret in American publications, has been freed from the veil of censorship in the February issue of the British publication, *Wireless World*. Six points brought out by *Wireless World*, with respect to radar, are:

(1) Radar is effective to at least 35 miles.

(2) Size of the object under observation can be measured to some extent.

(3) First location maneuvers can be made by rotating the receiving aerial of the apparatus.

(4) If a plane is under observation, its approximate elevation can be determined.

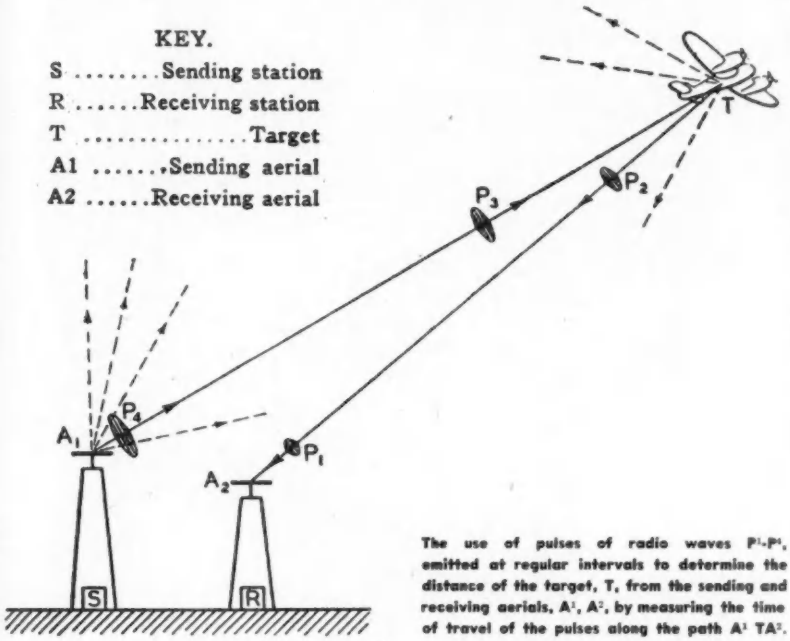
(5) In actual observation, a "picture" or "graph" appears on a cathode-ray tube installed in the receiving equipment.

(6) It is effective in observing stationary and moving targets.

The author of this article in the British publication is R. L. Smith-Rose, of the National Physical Laboratory, who states:

"A complete station consists of a combination of a transmitter and receiver. The transmitting or sending portion emits radiation over a broad arc in the approximate direction it is desired to explore. When this radiation strikes an object having an appreciable conductivity or dielectric constant, some of the energy is reflected or scattered back towards the receiver which is installed moderately close to the transmitter.

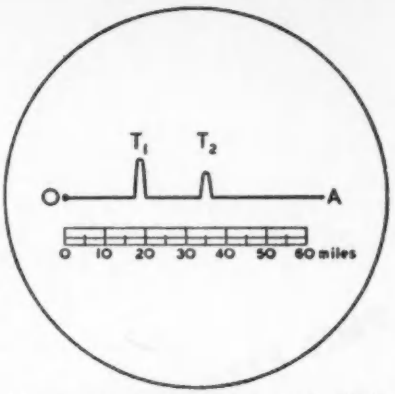
"If the latter emits the radio waves in short trains or pulses, the time of transit of these to the reflecting target and back to the receiver can be measured, by displaying the received signals on the screen of a cathode-ray tube."



The use of pulses of radio waves P^1-P^4, emitted at regular intervals to determine the distance of the target, T, from the sending and receiving aerials, A^1, A^2, by measuring the time of travel of the pulses along the path A^1 TA^2.

Accompanying Mr. Smith-Rose's treatise on radar were six charts. One showed the effect of reflections seen on a cathode-ray tube screen when contact has been made with an object under observation. The article is preceded by an editor's note which states, "For security reasons, *Wireless World* has hitherto been unable to publish the essential facts of RDF, radiolocation or radar—the various terms applied to the location of distant objects (more particularly, enemy aircraft), by wireless methods."

The application of radar to the telephone industry in postwar technical developments is already a matter of considerable exploration by telephone manufacturing experts. *Wireless World* offers this definition of the medium: "Radiolocation or radar may be described as the art of using radio waves for the detection and location of an object, fixed or moving, by the aid of the difference of its electrical properties from those of the medium adjacent to or surrounding it."



Type of echo display seen on screen of cathode-ray tube. The fluorescent spot sweeps along the time base OA in synchronism with the transmitted pulses. The received echoes from two targets are seen at a distance from O corresponding to the time taken for the pulses to travel to and from the targets T^1 and T^2. The time base can be provided with a range scale as shown.

V V

Pennsylvania Association Elects Officers

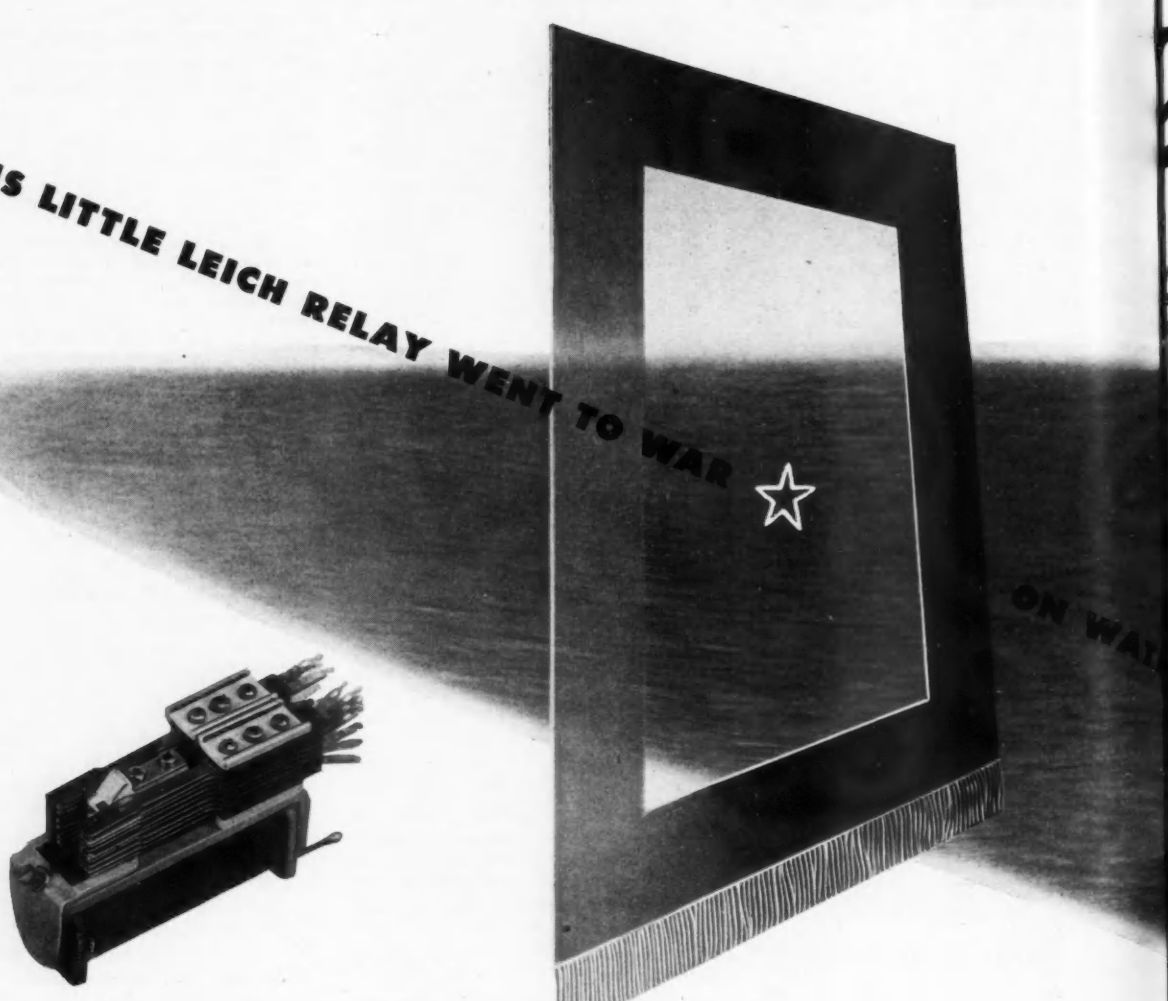
The board of directors of the Pennsylvania Independent Telephone Association met in Harrisburg on January 18 and elected the following officers: President, John M. Horn, Vandergrift; first vice president, Lester R. Thurston, Harrisburg; second vice president, Harry M. Engh, Erie; secretary, M. Ethel Cunningham, Harrisburg, and treasurer, George B. Rudy, Jr., York. Mr. Thurston was reappointed acting executive secretary.

Mr. Horn is president of the Vandergrift (Pa.) Telephone Co. He succeeded his father, the late John F. Horn who was largely responsible for the development of the enterprising community of Vandergrift and its industries, to this position. Since becoming president of his company, Mr. Horn has been an active and enthusiastic member of the Pennsylvania association.

Mr. Horn, a lawyer by profession, is a member of the law firm of Smith, Best & Horn of Greensburg, Pa. He is a former assistant district attorney of Westmoreland County, Pennsylvania, and a member of the Pennsylvania and American bar associations. He is a veteran of World War I.

Besides being president of the Vandergrift Telephone Co., Mr. Horn holds office and is a member of the board of the Vandergrift Water Co., and the Vandergrift Electric Light & Power Co.

THIS LITTLE LEICH RELAY WENT TO WAR



It is a curious fact that the war service of these little Leich relays is literally "none of our business." We do not refer to censorship. We mean that the manner in which they are being used is not their familiar employment in commercial telephone service.

The explanation is simple. They were drafted. Early in the war manufacturers of electrical control devices found an urgent need for relays of complete dependability—relays that would operate consistently under the most severe conditions. Immediately there arose a large demand for relays commonly designated as "telephone-type." Today, "telephone type" relays made by Leich Electric Company and other telephone manufacturers are doing their war job as faithfully as they performed in days of peace.

Credit for the splendid war record of these "draftees" belongs entirely to the progressive telephone operating man. It was his uncompromising attitude on quality that fathered their design. It was his loyal support of telephone manufacturing organizations that nurtured and built the facilities to produce them–facilities which, at a time he sorely needed them, he gladly relinquished for their greater duty.

Don't see that counts!

TAKE A LOOK at the Automatic Electric Dial — operate it just once — and you *know* why it is the chosen standard for hundreds of telephone companies all around the world. Its silk-smooth operation tells an unmistakable story of sound design, fine quality construction, and long trouble-free service.

But the real secret of this dial lies in the things you cannot see. It lies in unique design features which have grown out of fifty years of experience in dial manufacture —

In the craftsmen's skill which faithfully transfers these features from blueprint to finished product —

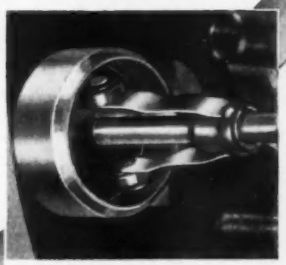
In the careful selection of material from which each part is formed for its exacting task —

In the exhaustive tests which safeguard every step of manufacture from raw material to finished product —

In the unique production methods and specially designed equipment needed to produce millions of dials — each one meeting highest standards of performance.

No wonder the Automatic Electric dial has proved — both by laboratory tests and by field experience — to be the longest-lasting dial ever made. When you need dials, you can have no safer guide than that!

Flanged finger-plate provides greater strength, minimizes "fly-wheel effect."



Fiber inserts in governor provide positive speed control, with negligible wear.

AUTOMATIC ELECTRIC

Originators and Developers of Strowger Step-by-Step Machine Switching Automatic Dial Systems
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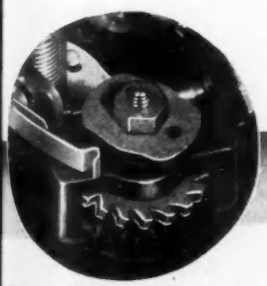
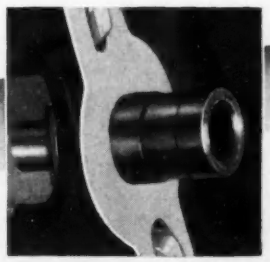
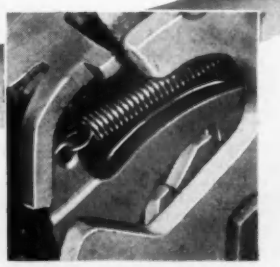


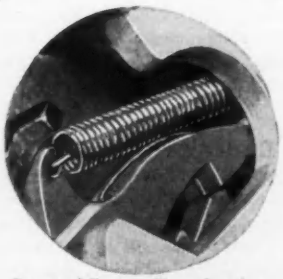
Special laminated pinion is self-lubricating, non-sticking, long-wearing.



Extra-long main bearing prevents side-play, minimizes wear.



Positive pawl-lock prevents dial over-running at end of its operation.



Patented "quieted" pawl makes this the world's quietest commercial dial.

THE PLANT MAN'S NOTEBOOK

BY RAY BLAIN • TECHNICAL EDITOR

EFFECTIVE November 1, 1944, the New Jersey Bell Telephone Co., made arrangements with the Veterans' Administration at Washington, D. C., whereby employes of that company returning from military and naval service may continue the payment of their premiums for National Service Life Insurance through the company's payroll deduction plan.

* * *

An increased interest is noted of late in the various types of electrical registers. For example, hospitals have an in-and-out register for doctors. These registers instantly indicate by means of signal lamps which doctors are on the premises and which are out. Remote control permits doctors to register in various parts of the building by merely flipping a switch. Registers of this type someday may become an auxiliary to the regular telephone system. Certainly, it would prove more economical to use one cable system for all forms of communication.

* * *

Apartment houses and hotels suffered a fire loss of about $16,000,000 last year, according to L. W. Hutchins, director, Safety Research Institute. This is about a $7,000,000 increase over the preceding year's fire losses for buildings of this type. No doubt, many valuable telephones were also lost in these fires; however, accurate figures are not available.

* * *

Electrically operated control equipment and remote controlled switches, contactors, relays and solenoid operated controls serve a most useful purpose in the modern telephone exchange, though reference seldom is made to this important equipment. The reason we do not hear much about control equipment probably is due to the fact that it is so well designed and carefully manufactured that it performs important functions for extended periods of time with very little attention or trouble.

Automatic transfer switches are electrically operated and designed to transfer a power load from the commercial power supply to an emergency, engine-operated generator or separate power service on failure of the normal, commercial power supply. The load is restored to normal when the power service is again in normal operation. This transfer is effected by the use of double-throw switches which are mechanically and electrically interlocked. Similar switches also are used for the control of generators used in the charging of telephone type storage batteries. Automatic control switches also may be used to advantage in changing ringing machines to battery operation on failure of the commercial power supply.

* * *

Some operating telephone men with whom we have discussed the present day rural telephone service problem are of the opinion that common battery service must be provided in order to satisfy subscribers. We do not entirely agree with this thought, although it must be admitted that common battery service is most desirable and can be considered entirely satisfactory for rural line service when and where it can be provided without excessive first cost and maintenance. We still contend, however, that magneto service is highly satisfactory when good equipment is installed and then properly maintained.

When for any reason common battery service is not possible or proves to be uneconomical for rural line service, there is little doubt but that a handset type magneto telephone will satisfy the average rural subscriber if the line and the connecting system operate satisfactorily. Perhaps the most serious drawback to present day magneto service is that subscribers just forget to "ring off," so as to operate the clearing out drop. If someone would discover some simple and automatic means of giving supervision on a magneto line, most of its objectionable features would be removed. Modern, long life dry cells do not present a maintenance problem when used on rural lines.

* * *

Slender, high efficiency, hot-cathode-type fluorescent tube lights will be manufactured as soon as wartime conditions will permit. Initially, these new lights will be available in 42, 64, 72 and 96 inches overall length, including the sockets and single pin bases at both ends. The diameter of the bulb ranges from three-fourths of an inch in the 42 and 64 inch lengths to one inch diameter in the 72 and 96 inch lengths. The standard, present-day 60-inch fluorescent lamp, the longest type now available, has a diameter of 2⅛ inches. The new lamp averages approximately 60 lumens for each watt of electricity consumed. It is claimed that the new, slender lamps consume only about half the wattage per running foot of tube as the fatter, standard types. This new type of lighting probably will find numerous applications in the telephone field.

* * *

It is claimed that the use of metal windows in tomorrow's buildings will be greatly simplified, and considerable savings effected, as a result of coordination of window design and dimensions, and reduction in the number of standard types just approved by the member-manufacturers of the Metal Window Institute.

Names George Butler Texas Life Insurance Commissioner

Through appointment by Gov. Coke R. Stevenson, and confirmation of the Texas Senate, George B. Butler, former executive secretary of the Texas Telephone Association, recently was named the next life insurance commissioner of Texas. This appointment carries the chairmanship of the commission with a six-year-term. The new commissioner expects to take oath of office for his new duties within a short time.

Mr. Butler was extended a leave of absence from the Texas association when Governor Stevenson inducted him into federal work, selecting him from a list of approximately 100 names, to the post of executive secretary of the Texas Salvage Committee of the War Production Board in April, 1942. He served in this capacity until the early part of February, 1944, when he was promoted to the position of Regional Salvage Manager, broadening the scope of his work covering Texas, Louisiana and Oklahoma.

V V

Elected State Representative

ALLEN M. GIBSON, secretary and manager of the Home Telephone Co., Sheffield, Pa., is a member of the Pennsylvania House of Representatives from Warren County. Mr. Gibson, who is an enthusiastic civic leader of Sheffield, was elected to this office on the Republican ticket at the 1944 elections.

V V

Signal Corps Day in Illinois

Gov. Dwight Green of Illinois proclaimed March 3, the 82nd anniversary of the establishment of the Signal Corps as a separate branch of the United States Army, as Signal Corps Day in Illinois. "More than half of all the radio, radar, telegraph and telephone equipment used by the Army is manufactured under the jurisdiction of Signal Corps agencies whose headquarters are in Chicago," the governor said.

V V

Recovering from Operation

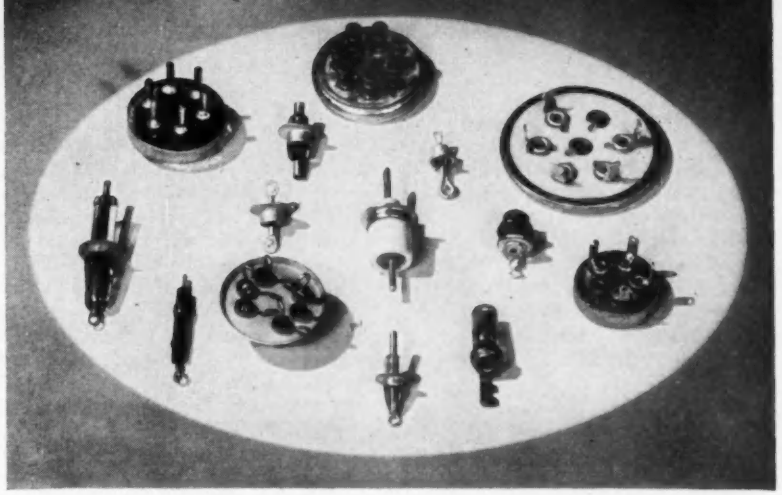
KARL MESS, president, Price County Telephone Co., Phillips, Wis., recently was reported recovering from a serious operation he underwent at a Marshfield Hospital on December 26, 1944.

V V

Returns from Hospital

HERSCHEL H. STONE, manager of the Colchester (Ill.) Farmers Telephone Co., returned home from the St. Francis Hospital on February 4 where he was critically ill for several weeks.

Which Terminal for Your *Hermetic Sealing* Problem?



● To correctly seal transformers and filters it is highly important to select the right terminal for each particular design. Relationships between electrical and mechanical requirements, space limitations and overall specifications are all important in the achievement of good performance – every factor must be given careful and detailed consideration.

Here at ADC, we use many types of terminals for hermetic sealing – making a point to use each where best suited. It takes a little more effort to produce final designs this way, but after all, knowing they're right for the jobs they have to do is what counts most with us and with you.

SEND FOR LATEST CATALOG!

ADC

Audio Development Co.

2833 13th Ave. S., Minneapolis 7, Minn.

by MAYME WORKMAN
traffic supervisor
the Illinois Telephone Association
and traffic editor

THE OPERATOR'S CORNER

WHEN SOMEONE asks the question, "How big are you?" we naturally think about our height, weight or chest expansion. There is another measurement, not so frequently thought of, which tells us how big we are. Dr. Preston Bradley, in one of his sermons at the Peoples' Church, Chicago, gave the best answer to the question, "How big are you?" Dr. Bradley stated:

"Are you big enough to stoop to serve another's need without the compulsion of duty or the lure of reward? Are you big enough to walk on your knees in humility in the presence of genuine greatness? Are you big enough to see beyond the petty trifles that wear down the lives of countless fellow mortals? Are you big enough to listen to every man's opinion without intolerance and still retain your convictions without bigotry? Are you big enough to play the game when victory seems most hopeless? Are you big enough to see another succeed without envy or jealousy? Are you big enough to be satisfied to crawl in obscurity when you wanted to fly? Are you big enough to see the bow on the distant horizon when all others have turned cynic? Are you big enough to see something more than sin in the most forlorn mortal, and something more than vanity in the most highly acclaimed? Are you big enough to endure a blow from both friend and foe, returning for it forgiveness? Are you big enough not to grasp at the stars, being assured that the simplest and nearest things are the sweetest things in life? Are you big enough to contemplate the great adventure without fear, while hope sees a star and love hears the rustle of a wing?

"If you are big enough for this, then you are small enough to be called great, and are one of God's little children; for of such is the Kingdom of Heaven."

We could use Dr. Bradley's sermon in taking our measurement in the traffic department as well as in our private lives. We could ask, for example, "Are you big enough to permit another operator to use a circuit she is not entitled to, when she insists upon doing so, without argument? Are you big enough to wish another operator well and to give her your wholehearted cooperation when she is promoted to a supervisory position you had hoped to receive? Are you big enough to take a correction and profit thereby? Are you big enough to accept hours assigned to you without question or grumbling even though the hours are not favorable from your viewpoint? Are you big enough to exchange hours with another employe requesting you to do so when this exchange may result in a slight inconvenience to you? Are you big enough to cooperate with a girl appointed as chief operator when you believe, because of your length of service, you are better qualified for the job? Are you big enough to work a little harder during congested periods without complaining or feeling sorry for yourself? Are you big enough to be tolerant and helpful to younger girls inducted into the service although their ideas and way of life may be foreign to yours? Are you big enough to remain silent when a customer berates or accuses you unjustly? Are you big enough to go a little beyond what is required in your line of duty when this action would be helpful to a customer, a fellow employe or your company?"

If you are big enough to do these things in your daily life while on duty in your office, you probably also will be big enough to measure up to Dr. Bradley's answer to the question, "How big are you?" in your personal life.

Leadership

The boss drives the men,
The leader coaches them.

The boss depends on authority,
The leader on good will.

The boss inspires fear,
The leader inspires enthusiasm.

The boss says "Get here on time,"
The leader comes ahead of time.

The boss says "I,"
The leader says "We."

The boss fixes the blame on someone,
The leader fixes the blame.

The boss knows how it's done,
The leader shows how.

The boss says "Go,"
The leader says "Let's Go!"

Questions from Illinois Operators

(1) On a local call, if the called station is slow in answering, should the operator change the connection?

(2) Why does an operator always ask, "Who are you?" when you ask her to ring another station?

(3) Should a supervisor be tied up working at the switchboard to the extent that she cannot see that traffic is kept moving in the best manner possible?

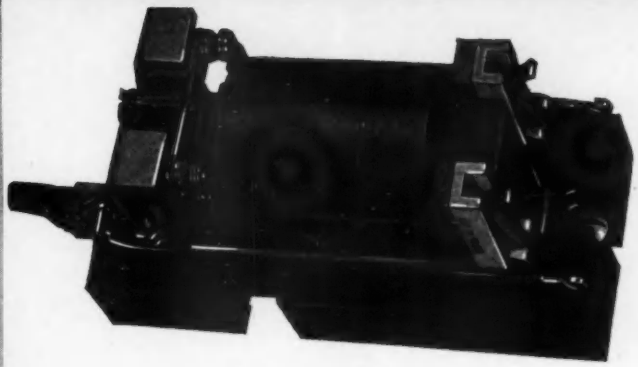
(4) On a local call, what should be done when a called party requests the name of the calling party after the calling party has hung up?

(5) If a station-to-station call has been completed and later a person reports ready to talk what action should be taken?

The answers to these traffic questions are presented on page 42.

FAHNESTOCK
ELECTRIC COMPANY, INC.

Type 3-A
Arrester Relay



SOLD BY

WESTERN RAILROAD SUPPLY COMPANY

2360 SOUTH ASHLAND AVENUE

CHICAGO 8, ILLINOIS

● For years there has been a definite need for the use of a protector of the type illustrated above. Its particular adaptation is on rural and toll lines where they parallel power lines for a considerable distance. Many REA lines are strung parallel with rural and toll lines throughout the country. Arrester Relay No. 3-A is the answer.

You Get ALL THESE EXTRAS

Tremendous Strength
Exceptional Uniformity
Smooth, True Surfaces
Thorough Impregnation
Clean, Dry Finish
EXTRA LIFE!

in Taylor-Colquitt Poles

You get a lot of "extras" when you use Taylor-Colquitt Poles of Southern Pine.

Sound, straight trees, from some of the finest stands in the South, provide poles with tremendous strength, and the uniformity that makes good-looking pole lines. Each pole is machine-trimmed, on special Taylor-Colquitt machines—turned out round and smooth and true. And then, after proper seasoning, it is treated with creosote—thoroughly impregnated to a depth of 2½ inches (or 95% of the sapwood)! A final treatment with live steam produces a clean, dry finish, makes poles easy to handle in any weather.

These Taylor-Colquitt "extras" at every point **pay off** in EXTRA YEARS of trouble-free service. That's why we sell, and recommend, Taylor-Colquitt poles.

TAYLOR-COLQUITT CO. T-C TIMBER CONSERVATION

AUTOMATIC ELECTRIC
SALES CORPORATION

1033 WEST VAN BUREN STREET, CHICAGO 7, ILLINOIS

Kentucky REA Co-Op Asks Limit to Commission Rule

Rural Electrification Administration co-operatives in Kentucky will ask the 1946 state legislature to remove them from jurisdiction of the Kentucky Public Service Commission, Curtis Brown, president of the Kentucky Rural Electric Co-operative Association, announced February 17.

Mr. Brown's announcement was the second major development following the commission's order of January 22, authorizing the Kentucky-West Virginia Power Co. to build 1,156 miles of rural extension in 16 counties in East Kentucky. Four co-operatives opposed the grant, claiming the territory for their own expansion. (TELEPHONY, February 24, page 30.)

The first effect of the commission's ruling was felt January 22 when William J. Neil, St. Louis, Mo., acting director of REA, suspended further loan allotments to Kentucky co-operatives until their credit risks can be re-examined in light of what REA construes to be discrimination against it in favor of private utilities.

Thomas B. McGregor, chairman of the commission, said the record will show the Kentucky commission has been one of the best friends REA has had in the nation. Mr. McGregor cited REA commendation of the Kentucky commission on several points, including pioneer aid to the co-operatives in obtaining a wholesale rate of "slightly above one cent per kilowatt hour" from private utilities.

Mr. McGregor said he is not surprised that the co-operatives want to withdraw from the commission, inasmuch as they have opposed its jurisdiction from the outset. REA co-operatives are under jursisdiction of public commissions in only a few states.

Co-operatives opposed commission jurisdiction in 1937 when the act was passed at a special session called by former Gov. A. B. Chandler. The governor, however, refused to include the REA act in his call unless the co-operatives would submit to commission jurisdiction. And after the act was passed, John M. Carmody, then director of REA, telegraphed Governor Chandler a request to veto it.

Mr. McGregor explained the principle authority held by the commission over co-operatives is in allocating territory between them and private utilities. The co-operatives are not assessed a pro rata for maintenance of the commission, as are other utilities under its jurisdiction.

As to the case in immediate issue, Mr. McGregor said it is the legal right of the co-operatives to appeal it to the courts. If a mistake was made by the commission in awarding the permit to the Kentucky-West Virginia Power Co., the courts will correct it, and if not, the courts will confirm judgment of the commission, Mr. McGregor said.

The commission has until the last of February to pass on the co-operatives' petition for rehearing.

V V

Appoints Samuel Bryan to Wisconsin Commission

Gov. W. S. Goodland of Wisconsin on February 5 appointed Samuel Bryan of Madison to the Wisconsin Public Service Commission to succeed Rueben Peterson who resigned as chairman of the commission on February 1. Mr. Bryan will serve for the remainder of Mr. Peterson's term ending March 5 and for the regular six-year-term beginning on that date.

Mr. Peterson is now general manager of Public Utilities Reports, Inc., Washington, D. C., which publishes volumes containing court and commission decisions in public utility cases throughout the country. It also publishes *Public Utilities Fortnightly*, a magazine devoted to the interests of the utilities industry.

Mr. Bryan, a native of Washington, D. C., received his bachelor and master's degrees from Leland Stanford University and went to the University of Wisconsin in 1911 as a graduate student in political science. He joined the old railroad commission as an employe in 1912, was admitted to the bar in 1927, and has been on the commission's examining staff for 20 years.

V V

FCC Orders Probe of Toll Service at Maryville, Mo.

The Federal Communications Commission on February 20 adopted an order of investigation into the matter of apparent need for interstate and foreign telephone long distance service in the area of Maryville, Nodaway County, Mo.

The Peoples Telephone Exchange, Inc., Maryville, which has in the past operated as a mutual, operates a telephone exchange and telephone system which serves about 1,000 persons residing in Maryville and adjacent rural areas, who do not have any long distance service except communication within certain areas in northwest Missouri and southwest Iowa. Informal complaint has been made to the commission by that company and others with respect to the refusal of Southwestern Bell Telephone Co., St. Louis, and the Hanamo Telephone Co. to provide a toll connection making such long distance service possible. The Hanamo Telephone Co. also operates a telephone exchange in Maryville connected with the lines of the Southwestern Bell.

The areas involved are important agricultural and livestock producing

areas, and it is asserted that long distance service is required in order to provide communication with livestock and agricultural market centers, to make calls for farm labor, equipment, repairs, and to make other arrangements in connection with farming operations.

The commission ordered the investigation into this situation for the purpose of determining whether a physical connection should be required between the facilities of the Peoples Telephone Exchange, Inc., and the Southwestern Bell Telephone Co. or the Hanamo Telephone Co. in order to make adequate interstate and foreign telephone service available in these areas, and further ordered each of these companies to show cause why such physical connection should not be effected.

[*See "In the Nation's Capital," page 16.*]

V V

Duluth, Minn., Company Buys London Independent

The joint application of the Duluth, Missabe & Iron Range Railway Co., Duluth, Minn., to purchase the property of the Northern Minnesota Telephone & Telegraph Association, London, Minn., seller, was granted by the Minnesota Railroad & Warehouse Commission on February 21.

The Northern Minnesota company, a cooperative association, owns and operates a telephone system serving residents in London and the rural territory in the vicinity thereof. The sale refers only to a part of the telephone system which extends for a distance of 18 miles from Two Harbors to London, Lake County. Service north of London, heretofore maintained by the Northern company, will not be maintained by the Duluth, Missabe & Iron Range Railway Co.

In its approval, the commission gave no consideration to the price or value of the property.

V V

Authorize Increased Rates For Woodstock, Minn., Company

The Woodstock (Minn.) Telephone Exchange was authorized by the Minnesota Railroad & Warehouse Commission on February 21 to place in effect as of April 1 the following, proposed rates:

Service	*Old Rates*	*New Rates*
Individual line, business...	2.00	$3.25
Two-party business.....	...	2.75
Individual line, residence.	1.25	2.00
Four-party residence	...	1.75
Multi-party rural	1.25	2.00

The Woodstock company serves approximately 26 local and 45 rural stations. More than 89 per cent of these subscribers petitioned the commission

SAFETY

FOR LINEMEN WITH "KLEIN-KORD"

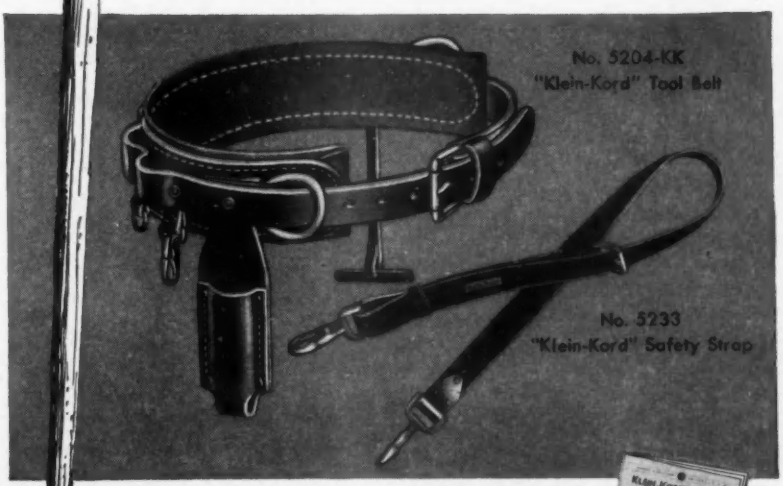
"Klein-Kord" is an exclusive material developed by Mathias Klein & Sons for use in linemen's safety straps, belts and climber straps.

It is made of a number of layers of long-staple cotton of special weave, each ply laid in rubber and vulcanized. This construction permits the use of a tongue buckle, eliminating the danger of slipping or excessive wear characteristic of a friction-type buckle.

The tensile strength of "Klein-Kord"—its resistance to ripping at the buckle—provides a full factor of safety. It does not stretch under load; is uniform in quality; and resists accidental damage from cuts, heat, etc.

"Klein-Kord" has behind it several years of actual service and today is specified exclusively by many of the largest utility companies.

Climbing equipment of "Klein-Kord" will assure the maximum in safety and comfort to the man on the pole.



ASK YOUR SUPPLIER

Foreign Distributor:
International Standard Electric Corp., New York

Safety engineers, purchasing agents and others interested in linemen's equipment can obtain a folder on "Klein-Kord" on request. Write for your copy.

KLEIN TOOLS

Since 1857

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
3200 BELMONT AVENUE, CHICAGO 18, ILLINOIS

and the Office of Price Administration for approval of the increased rates.

The book cost of the property useful in rendering service was listed at $4,200.

V V

Plan to Put Michigan Bell Rebate in Escrow

Members of the Michigan Public Service Commission conferred with representatives of the Michgan Bell Telephone Co. in Detroit on February 26 to work out a program to put in escrow the $3,500,000 in rate rebates to telephone users the commission has ordered, W. J. McBrearty, commission chairman said February 22. (TELEPHONY, February 3, page 30.)

Chairman McBrearty said the commission feared that if some escrow arrangement were not worked out, the company might not be able to make the rebates because of federal income tax payments due March 15.

V V

Federal Judge Remands Personal Injury Suit

An order remanding the case of Ruth B. McMahon against the Lincoln, (Neb.) Telephone & Telegraph Co., Iowa-Nebraska Light & Power Co. and Consumers Public Power district to the district court of Fillmore County, was signed by Federal Judge John W. Delehant. (TELEPHONY, December 23, page 30.)

Mrs. McMahon seeks $12,000 damages for personal injuries sustained at the Fillmore County fair in 1944 when she allegedly tripped over a pole with wires attached which was used jointly by the defendant companies. She alleges that the pole had been negligently allowed to lie on the ground.

V V

Discontinue Two Party, Residence Coin Box Service

The Ohio Public Utilities Commission on February 21 gave the Cincinnati & Suburban Bell Telephone Co., Cincinnati, permission to discontinue its two-party, residence coin box telephone service because where there once were 1,285 subscribers to this service there is now only one.

Utilities commission employes said the lone subscriber was a man in his seventies who hated to make a change.

V V

To Purchase Kansas Independent

Ross Gault, owner of the Glen Elder (Kan.) Telephone Co., recently made arrangements to purchase the Inland Telephone Co., Wellsville, Kan., from M. R. Campbell who has managed that company since 1930 when it took over the Wellsville Cooperative Telephone Co. Consummation of the sale will be effective upon approval by the Kansas Corporation Commission. (TELEPHONY, February 17, page 33.)

V V

Increase Rental Rates

The Brocket (N. D.) Farmers Telephone Co. was granted authority to increase rental rates on all telephones, effective February 1, the North Dakota Public Service Commission announced. The new rates make effective an increase of 50 cents per month on rural and town, business telephones, and 25 cents a month on town, residence telephones.

V V

Summary of Commission Rulings and Hearings

Illinois Commerce Commission

February 20: Hearing on application of Harrisonville Telephone Co., Waterloo, for authority to issue $65,000 of its capital stock. Postponed from February 7.

February 20: Hearing on proposed advance in rates for service rendered by Suburban Telephone Co., Dunlap.

Kansas State Corporation Commission

March 6: Hearing on application of Farmers Cooperative Telephone Co., Halls Summit, for authority to make certain rate changes. Re-scheduled from February 27.

March 6: Hearing on application of Home Telephone Co., Scottsville, for authority to make certain rate changes. Re-scheduled from February 27.

March 6: Hearing on application of Lehigh (Kan.) Telephone Co. for authority to make certain rate changes for switching service there. Re-scheduled from February 27.

March 6: Hearing on application of Huron (Kan.) Telephone Co. for authority to make certain rate changes.

March 6: Hearing on application of Peoples Telephone Association, Athol, for authority to make certain rate changes.

March 6: Hearing on complaint of A. J. Detrixhe and three neighbors against Southwestern Bell Telephone Co. and American Telephone Co., Abilene, for relocation of boundary line.

Louisiana Public Service Commission

March 2: Hearing on proposed revision of rates for service at Oak Grove rendered by Bethany-Converse Telephone Co., Greenwood.

V V

Telephone Men Liberated At Manila

Out of the stirring stories of events following General MacArthur's return to the Philippines has come the long-hoped-for news of the liberation of several telephone men from Japanese internment camps. Definite news has already been received as to the safety of two representatives of Automatic Electric Co. and two employes of the Philippine Long Distance Telephone Co.

The Far East representative of Automatic Electric, Edwin R. Girard, will be remembered by many Independent telephone men in the United States. For many years a member of the company's installation and operating department, he joined the sales organization in the early thirties, making his headquarters in the Cleveland office. In 1936, he was selected to go to Shanghai as the company's representative in the Far East. Early in 1940, the Japanese invasion of China forced removal of his headquarters to Manila. In July of the following year, he came to the United States with his wife and daughter on a leave of absence, returning alone to Manila late the same year, only to be caught there at the time of the Japanese invasion of Luzon. Only one message had been received by his family since that date.

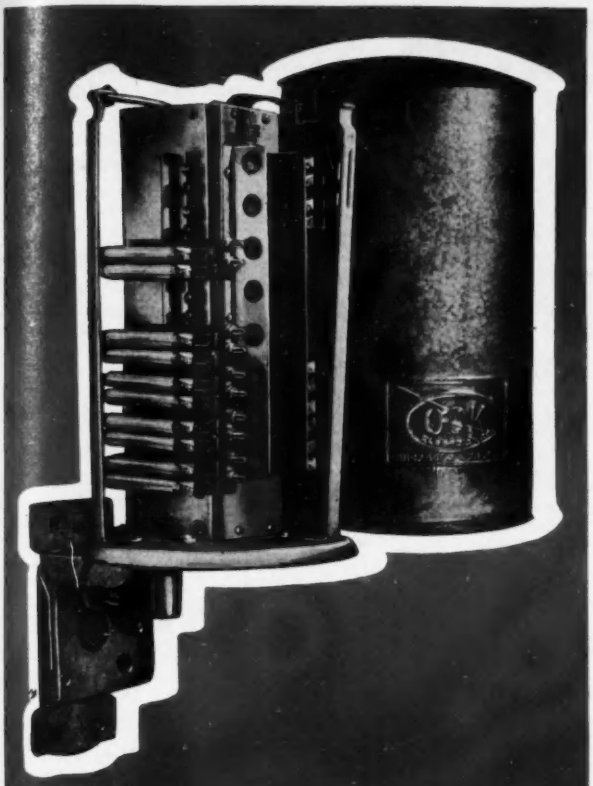
On February 23, a representative of the Chicago *Times*, dropping with American paratroopers on the Los Banos internment camp a few miles south of Manila, was first greeted by Mr. Girard, who had lost much weight through malnutrition, but was otherwise unharmed. The Chicago office of the *Times* promptly relayed news of his safety to Mrs. Girard at San Francisco.

News has also been received of the liberation, from the same camp, of D. Galassi, former managing director of Automatic Electric's factory in Italy. Mr. Galassi was in Manila at the time of the Jap invasion.

A few days earlier, with the rescue of the prisoners in the Santo Tomas internment camp, had come the news of the freeing of two members of the Philippine Long Distance Telephone Co.—Theodore Hall, vice president and assistant general manager, and Selmar Oftedahl, equipment engineer. Mr. Oftedahl was at one time a member of Automatic Electric's equipment engineering staff, and has been with the Philippine company since the early twenties.

Others whose safety is hoped for, but who are yet to be heard from, include John McCain, plant manager, and William Gallipeau, maintenance superintendent of the Philippine Long Distance Telephone Co.

Buy War Bonds



S-20

THE POLE CABLE TERMINAL FEATURING THE MAXIMUM IN

- **ECONOMY**
- **CONVENIENCE**
- **ACCESSIBILITY**

IN INSTALLATION, SERVICING AND MAINTENANCE.

The Type S-20 Pole Cable Terminal and Protector Mounting is in wide use as a combined protected and unprotected all steel cable terminal. As part of the Trans-Mount System, the S-20 offers maximum economy because Type H Protector Mounts may be installed as required.

The self-soldering nozzle of the S-20 is located close to the pole to bring the cable behind the subscribers' drops. The mounting base is open at the back adjacent to the pole to prevent accumulations of ice, dirt or moisture. A separate mounting bracket shaped to fit the pole provides easy installation without gaining the pole. Drop wires enter the terminal through individual insulating knockout holes.

Every possible feature of convenience and accessibility for installation, servicing and maintenance has been carefully engineered in designing the S-20. All connections are at the front, the self-soldering nozzle lies close to the pole, a strong guide holds the hood securely in raised position for working ease, and drops are taken out through knockout in an insulating plate to prevent the entrance of birds, insects, dust, etc.

The TRANS-MOUNT SYSTEM

The S-20 Pole Cable Terminal is part of the Cook Trans-Mount System of Protection and Distribution. The Trans-Mount System is composed of the Type S-20 Pole Cable Terminal, the Type R Sub-Station Protector, the Type T Main Distributing Frame, the Type U Utility Sub-Station Protector, the Type UA-20 Aerial to Underground Terminal and the Type IT-20 and Type TN-20 Interior Cable Terminal Vaults, all using the Type H Protector Unit.

2700 SOUTHPORT AVENUE
CHICAGO 14, ILL.

COOK ELECTRIC Company

THIS ANNUAL REPORT IS DOWN TO EARTH

APPARENTLY believing in the theory that the public should be informed of the operations of his telephone company, C. C. Pearce, manager of the Farmers' Telephone Co., Riceville, Iowa, one of the most progressive small Independent telephone companies in the country, recently issued an "Annual Report to the Subscribers of the Farmers' Telephone Company" for 1944, in which he told the company's customers where and how their telephone dollars were spent in 1944.

As Mr. Pearce's report is so radically different than the usual annual report, the following excerpts are published:

"Each year we make a number of improvements in our telephone plant, but many times the nature or the location of the work being done is such that few subscribers realize that any work is really being done to improve their service. We may not have worked along your road or may not have been in your home during the year 1944, but each time we set a pole or put up a mile of new wire or make any change or improvement along any line, we are improving the service of each individual telephone, because the very next call you may have, could very easily go over a line many miles from your home or business. In other words, your service is just as good as the weakest line.

"On the following pages are a few facts which we believe will interest you and will give you a better understanding of what your telephone company is striving to do in order that the promise which we have made several times may be fulfilled. That promise being; that we would continue to make improvements until you have the best telephone service and equipment that it is possible to provide.

"We make this report to you because we feel it is to your interest to know what we are doing with your telephone dollars.

"$8,044.58 for Improvements in 1944

"This was the total amount which we added by both material and labor to improve your service. The above figure amounts to about $12.50 per telephone in added investment. Much of this work has not been completed to an extent where any degree of improvement in service can yet be noticed, due mainly to the restrictions placed on the telephone companies, which has kept us from completing various projects.

"A total of 703 new poles was set. This would be enough to build a line about 24 miles, if they were all set in one line.

"A total of 68 miles of new wire was put up, approximately enough to build a line to Waterloo. Over 200 new cross arms, 3,000 glass insulators besides anchors, hardware, guy wires, pins, brackets, spikes and dozens of other miscellaneous items were put into your telephone plant.

"We cleared over 800 cases of trouble during the year. There were only about 170 of these that were reported by the subscribers. The balance was taken care of before being reported.

"The total number of long distance calls placed by our subscribers was 16,874 during the 12 months, which makes an average of about 26 per telephone. In all probability long distance calls received by our subscribers were equal or exceeded that number.

"During a busy hour at our Riceville switchboard an operator handles about 400 calls. This is made possible only by your cooperation in calling by number, and each operator is very appreciative of the fact that the calls are placed nearly 100 per cent by number. This is a big help to her in giving you prompt service.

"It takes a lot of monev and hard work to provide telephone service.

"We seek to give you adequate, efficient service at all times. War conditions make our task a bit difficult. Your continued cooperation and understanding are deeply appreciated.

"Where Your Telephone $$ Went in 1944

"We found the actual amount of each dollar taken in as *telephone rent* went for the following purposes in order to give you telephone service.

"This does not include any money for taxes or tolls which appeared as separate items on your bill.

Truck expense	.04½
Insurance	.07
Interest	.01½
Light, heat and water	.02
Rent	.03
Miscellaneous repairs	.04
Postage, advertising, clerical help, billing, printing, etc	.09
Labor other than operators	.32
Operators	.28
Improvements	.47
Taxes	.15
Total	$1.53

"In other words, for each dollar that you paid in *rent* it was necessary for us to add 53 cents from other sources in order to give you service.

"Of the total money which you paid us during 1944 the average was $8.26 per telephone for taxes which includes those which were added on your bill and those which we pay out of rent dollars, which to you would be hidden taxes. We paid a total of 12 different kinds of taxes directly to the government, which involved the making of 47 different reports.

"Each year we have our books audited by a certified public accountant and the figures in this report are taken from the report as made at the close of business on December 31, 1944."

Mr. Pearce states that he has received many favorable comments on the report from subscribers and that it has made the public more telephone conscious, resulting in complaints being made in "a little softer tone of voice."

The editor of the Riceville newspaper, in a feature column, commented as follows on the report:

"We suppose that you as we, recently received one of those folders from the Farmers' Telephone Co., telling where the dollars go, etc. We found it very interesting. Especially the table showing that for every rent dollar received the company pays out $1.53. Also the fact that during a busy hour about 400 calls are handled here. And we certainly never thought the company installed enough new wire last year to run a line from here to Waterloo. That's quite a ways. And just think $8,044.58 was spent for improvements alone in 1944. In fact the entire folder was full of good information, so if you did not take time to read it, do so as we assure you that you will enjoy it. The telephone service is one thing that we always felt Riceville could be justly proud and with the constant improving we soon can boast one of the best exchanges in the nation for a town this size."

V V

WLB Panel Asks End of Paid Living Expenses for Operators

A War Labor Board telephone panel report on the Ohio Bell Telephone Co. dispute which threatened to tie up several large Eastern exchanges in November, recommended to the War Labor Board February 15 that the company be directed to discontinue by May 15 its practice of paying living expenses to operators transferred to the Dayton exchange, and that the union consider the company's offer to ask WLB approval of a temporary increase in beginners' wage rates, it was reported. (TELEPHONY, December 2, page 34.)

The industry member of the panel dissented in part. He agreed that the payment of living expenses to the transferees should be eliminated at the earliest practical date, "but does not believe that the panel can make any recommendation the fulfillment of which might place the company in a position of having to jeopardize service under present war conditions."

The union had contended that the transferring of operators and the payment of their expenses in addition to salary during the war was a device to avoid increases in basic salaries.

V V

May Limit Conversations

A bill, seeking approval to limit telephone conversations on party lines to five minutes, was introduced in the Iowa Legislature on February 16.

Drive 150,000 Miles Without An Accident

Two Pittston, Pa., employes of the Bell Telephone Co. of Pennsylvania, who have driven company motor vehicles a total of 300,000 miles without being responsible for a single accident, were honored recently.

The employes are James T. Murphy and Thomas L. Davis, both of whom are veteran members of the company's Hundred Thousand Mile Club, organization of men who have driven that distance safely. Both Mr. Murphy and Mr. Davis, have now completed 150,000 miles of safe driving.

V V

Indiana College Offers Television Course

A study of television is being inaugurated in Evansville (Ind.) College during the current semester, under direction of Prof. John A. Needy, director of technology and engineering.

The first course in the new field will be television engineering, taught by Fay Gehres, a licensed radio operator for the last 20 years and chief engineer of radio station WGBF since 1932.

Mr. Gehres has received training in television engineering with the Radio Corp. of America and with the National Broadcasting Co. He also has studied radio engineering in Ohio State and Indiana universities.

V V

Appointed Vice President Of New Jersey Bell

Jesse Black McCullen recently was appointed vice president in charge of public relations for the New Jersey Bell Telephone Co., it was announced by the company.

He has been with the New Jersey Bell Telephone Co. continuously since 1920, with headquarters at Newark, N. J.

V V

Takes Post In South America

H. W. REED, former wire chief for the Southwestern Bell Telephone Co., at Mexico, Mo., recently was appointed superintendent of the Compania Telefonica Centra Communications, Bogota, Columbia, S. A., including overseas radio-telephone.

V V

Independent Manager Promoted

ELVIN DURR, for six years district manager at Mound City, Mo., for northwest Missouri for the United Telephone Co. of Kansas City, has been promoted to division plant manager with headquarters at Clinton, Mo.

STROMBERG-CARLSON
RECOMMENDS—

The CHURCHILL
An ATTRACTIVE
TELEPHONE BOOTH

Not only attractive—but comfortable and private—the **CHURCHILL** No. 100 Folding Door Telephone Booth will increase your pay station business.

Operating companies have found the **CHURCHILL** No. 100 Folding Door Telephone Booth a builder of pay station business.

It is constructed as a single unit and equipped with a reinforced back panel for mounting a wall telephone or coin collector.

The **CHURCHILL** Booth is made of selected white oak and is available in light or medium oak in a satin finish.

Included as standard equipment are electric light and automatic electric ventilator.

Overall height is 84¾"; width, 29"; depth, 30½". Shipped knocked down and crated.

Illustrated literature available.

Simplify
TREE TRIMMING
with
BARTLETT
EQUIPMENT

Bartlett No. 1-WE Combination Pruner & Saw

Here are two complete tools that can be carried easily in a small car, as the longest section is only 8' 4". The combination consists of:

	Length	Weight
No. 1-WE Pruner Head Section	30 in.	2¾ lbs.
No. 44-WE Saw Head Section	30 in.	1½ lbs.
Intermediate Extra Section	100 in.	2½ lbs.
Bottom Extra Section	100 in.	2¼ lbs.
	TOTAL WEIGHT	9 lbs.

From these can be made either one of two tools, as follows:

1 Heavy Duty Tree Trimmer (1¼" Capacity) ..... 18½ ft.
1 Fast-cutting Pole Saw ..... 18½ ft.

When longer lengths are required, extra sections can be specified—4 or 6 ft. long.

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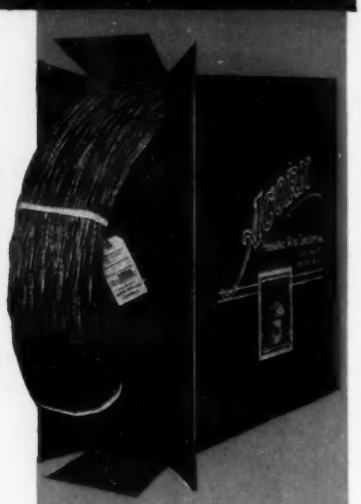
TODAY TELEPHONE WIRE has to be tough

Follow the lead of the man who has standardized on ACORN. Stop that costly march to the scrap heap.



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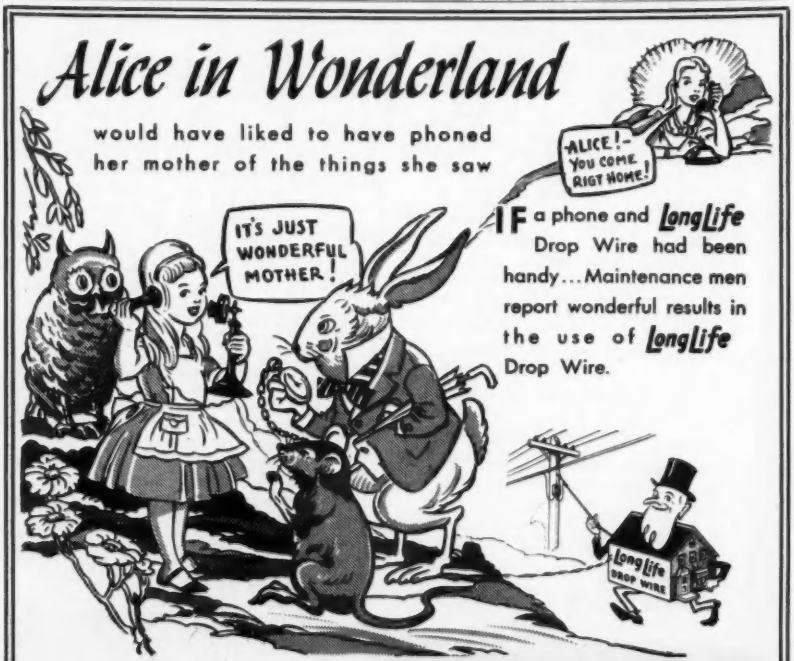
PREVENT ACCIDENTS! ACORN'S exclusive Carton Packaging for Safety and Better Warehousing.

Drop Wire—Bridle—Interior—Tree—Ground—Switchboard—Pothead—Cable Terminal—Instrument—Fixture—Buried Wire

Alice in Wonderland

would have liked to have phoned her mother of the things she saw



IF a phone and LongLife Drop Wire had been handy... Maintenance men report wonderful results in the use of LongLife Drop Wire.

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THE WHITNEY BLAKE CO.
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Well Built wires since 1899

Wisconsin Association Directors Re-Elect Officers

In view of the decision to cancel the 1945 convention, the directors of the Wisconsin State Telephone Association met on February 2 to elect directors and officers for the ensuing year. The following directors, whose terms expired this year, were re-elected to serve until the next annual convention: A. H. Bowden, Almond; S. B. Lockwood, Mondovi, and W. E. Lawton, Viroqua. The term of Director D. G. Smart, Wisconsin Rapids, expired in 1945 and due to business conditions, he requested that he be replaced on the board. Also, there was a vacancy on the board due to the recent death of E. E. Ringrose, Black River Falls. The directors nominated J. W. Welch, Mt. Hope, and J. F. Benjamin, Cumberland, to fill these two vacancies.

The present officers were unanimously re-elected as follows: President, E. B. Samp, LaCrosse; vice president, Walter Dakin, Madison; secretary, Mr. Bowden; treasurer, Mr. Lawton, and recording secretary, J. E. Byrne, Madison.

The directors voted to render to the United States Independent Telephone Association the fullest cooperation in connection with the proposed federal Rural Telephone Administration legislation. President Samp appointed a special rural service committee and it was charged with full authority to make decisions and take any action in connection with the rural telephone service matter. The committee is composed of: Mr. Samp, as an ex officio member; Mr. Dakin, chairman; Mr. Bowden; B. H. Piepmeier, Black River Falls; F. M. McEniry, Milwaukee, and Mr. Lawton.

V V

Name Bozell Director

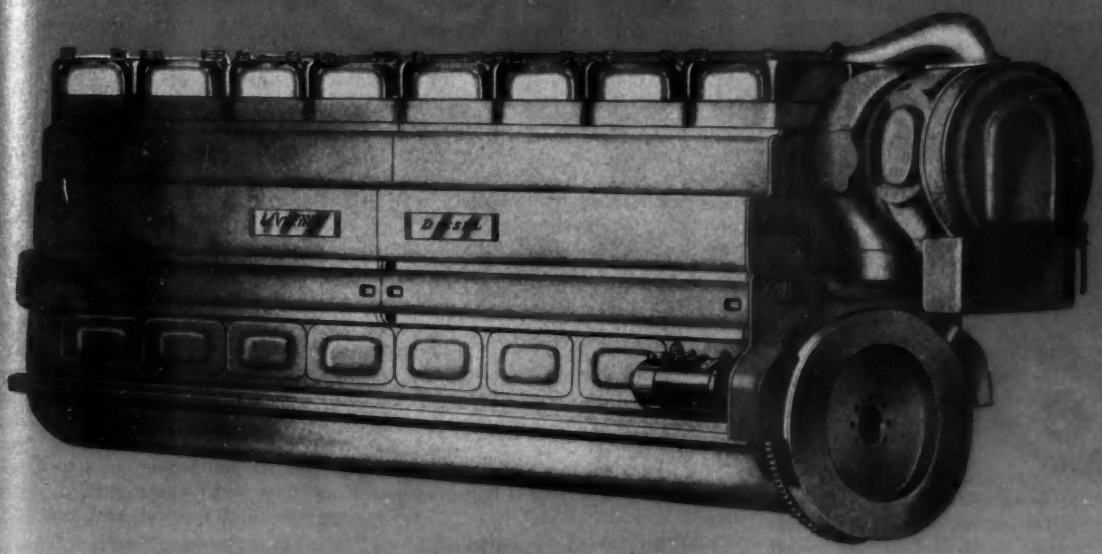
H. V. Bozell, New York City, president, General Telephone Corp., is included in the list of nine persons which the trustees of the Associated Gas & Electric Co. and of the Associated Gas & Electric Corp. have filed with the Securities & Exchange Commission as the board of directors for the reorganized utility system.

V V

Saves the Telephone

When an oil heater caused a fire at the little taxicab office in Alton, Ill., recently, the only thing saved was the telephone. The boy in charge grabbed the telephone and stepped to the door to turn in an alarm. By then, it was too hot for him to move back into the place, so he took the instrument along with him, tearing loose the connecting wires.

DIESELS *by Sterling*



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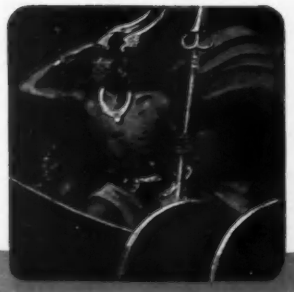
★ So great has been the interest in the new Sterling Viking Diesel that we have already set up production line methods of manufacturing this advanced streamlined engine. This means we can accept orders now for early delivery of this modern improved power plant for operating electric generators, water pumps, draw bridges, dam sluices, shovels, bulldozers, snow plows and many other power applications. Sterling engineers will gladly cooperate in planning installations of the Sterling Viking Diesel best suited to your particular requirements—six or eight cylinder; supercharged or unsupercharged. Write for illustrated engineering bulletins.



Other Sterling engines—gasoline, gas, butane and Diesel, from 85 to 1800 horsepower—also available.

"KEEP BUYING WAR BONDS"

STERLING

VIKING DIESEL

STERLING ENGINE COMPANY, 1293 NIAGARA ST., BUFFALO 13, N. Y. *Offices in New York, Washington and Chicago*

RED CROSS PREPARES FOR NEW DRIVE

THE AMERICAN Red Cross is preparing for its 1945 war fund campaign in an effort to raise $200,000,000 for its work in helping the fighting men overseas, as well as in providing hospital and other numerous services on the home front. Because of further increased activities, the Red Cross asks that all Americans lend their full support to the 1945 campaign which will be in progress during March.

Highlights of Red Cross operations in 1944 include:

(1) American Red Cross now has 727 clubs serving and entertaining an average of 7,130,000 G.I.'s a month. These range in size from a grass hut in Leyte to the famous Rainbow Club in London. In addition there are 194 "clubs on wheels."

(2) Red Cross hospital service both at home and abroad has helped over 1,300,000 cases during the past year. The hospital recreational setup in this country alone consists of 327 recreation rooms and buildings, together with 5,149 sunrooms where during the past year 150,000 movies were shown.

(3) Red Cross field directors deal with thousands of matters affecting our fighters, including family allowance payments, business, divorce, marriage, crops, health, lack of mail, etc.

(4) Fourteen million communications have been handled in the past year and 4,500,000 servicemen and their families have been helped and assisted. In addition 350,000 ex-servicemen also have received aid. Red Cross men have been in on every major invasion since the start of the war.

(5) Red Cross home service furnishes a day and night home front service on the home fronts for assistance to families of our fighters.

(6) Over 20,000,000 parcels have been packed for prisoners of war. The Red Cross also had distributed 12,700 medical kits and 10,000 captured parcels.

(7) Red Cross Volunteer Special Services have made over 775,000,000 surgical dressings alone in the past year. Garments and kit bags also run into the millions. Training certificates awarded for canteen, dietetic home service, hospital and recreation, motor corps, nurse's aide and staff assistants exceed 125,000.

(8) Red Cross Foreign War Relief involves an area in which live persons equal to the population of Texas, California, New York, Illinois and Michigan.

(9) Three hundred thousand home nursing certificates were issued. Fifteen thousand nurses were recruited for the Army and Navy.

(10) The Junior Red Cross (the largest youth organization in the world) has made 15,000,000 articles for members of the armed forces. In addition, this outfit has collected 50,000 tons of salvage.

(11) The Red Cross gave relief in 259 disasters throughout the United States. *This was the largest number for any single year!* The total number of persons aided was 68,000. There is no impairment in service in the Red Cross normal peacetime activities such as first aid, water safety, nutrition service and medical and health.

(12) Between March, 1944, and March, 1945, the Red Cross will have

A Ringing Converter

Low in Price . . .

Low in Upkeep . . .

Converts commercial AC power to uniform ringing current, without moving parts. The initial cost is low. It's easy to install — requires no routine maintenance.

Six models from small PBX to Large Central Offices

SUB-CYCLE

- No Radio Interference
- Quiet Operation
- Produces Reverting Tone

ALSO PULSATORS

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LORAIN, OHIO

FUNDAMENTALS OF TELEPHONY

By **ARTHUR LEMUEL ALBERT**

Professor of Communication Engineering, Oregon State College

374 pages, 5½ x 8½, 200 illustrations, $3.25

This book tells how and why telephone apparatus and lines operate as they do, covers the electrical theory and circuits with which every telephone worker should be familiar. It explains the phenomena of sound as they apply to telephony. It gives a practical knowledge of the functioning of transmitters, receivers, and other elements of telephone sets and systems, including modern manual and dial systems. It shows the requirements of local and toll transmission lines and how they are met, covering electrical measuring instruments, the measurements used in telephony, the problems of interference in telephone circuits, and other topics, in a clear, well-illustrated, elementary treatment, especially arranged for the non-engineering reader.

Check the data in these chapters

1. Direct-current Theory
2. Alternating-current Theory
3. Electric Networks
4. Sound, Speech, and Hearing
5. Telephone Transmitters
6. Telephone Receivers
7. Telephone Sets
8. Manual Telephone Systems
9. Dial Telephone Systems
10. Transmission over Circuits with Distributed Constants
11. Transmission over Circuits with Lumped Constants
12. Measurements in Telephony
13. Inductive Interference
14. Telephone Repeaters and Carrier Systems

Order a Copy from

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St. Chicago 5, Ill.

collected 5,000,000 pints of blood. The total since February, 1941, is about 11,000,000 pints.

(13) From the beginning of the war to the time of the opening of the 1945 War Fund campaign, which is March 1, the estimated expenditures of the American Red Cross will be, roughly, $394,000,000. The quota this year is $200,000,000.

(14) The American Red Cross has over 6,000,000 volunteers now working.

(15) Red Cross overseas workers as of December, 1943, total 4,471; as of December, 1944, total 7,582, serving in 52 different countries and islands where Yank troops are stationed.

V V

Service Rapidly Restored After Sparrows Point, Md., Fire

Telephone operators from the Sparrows Point, Md., exchange of the Chesapeake & Potomac Telephone Co. of Baltimore City, after sticking to their posts until the last minute, filed down a smoke-filled stairway to the street on January 7 where, from behind crowded fire lines, they watched flames consume the building. The fire completely destroyed communications with other points for the war-busy community.

Within less than two hours, telephone lines of the Bethlehem Steel Co. were connected with a nearby central office and by January 13, a new central office switchboard was placed in operation. The company not only made complete restoration of service for all of its 1,300 customers within less than one week, but within one day had provided emergency service for all war industries and those persons essential to the public health, welfare and security of the community.

V V

Finney to Fort Myers, Fla.

LAWRENCE H. FINNEY, Williamsport, Ind., recently was appointed general manager of the Inter-County Telephone & Telegraph Co., Ft. Myers, Fla.

V V

Buys Bell Interest

S. A. LANE, president, Western Arkansas Telephone Co., Russellville, Ark., announced recently that he has purchased the interest of the Southwestern Bell Telephone Co. in his company, effective January 8.

V V

Named USO President

K. B. CARY, Lincoln district commercial manager, Lincoln (Neb.) Telephone & Telegraph Co., recently was named president of the Lincoln USO Board.

All these and many more are the comments of busy executives on what Teletalk Intercommunication Systems have meant to them in these war busy days.

"Teletalk saves 50 to 100 trips a day . . . ten miles of walking," says an Iowa foundry.

"Teletalk makes all our plant operations more efficient," says a laundry machinery manufacturer.

"Teletalk gives us the speed which is the essence of all our contracts," says an engineering company in New Jersey.

"Teletalk instantly provides the 'finger-tip' information to answer 150 telephone calls a day," says an Illinois company.

These are important problems these days to scores of war-busy concerns among your subscribers. To help solve them will increase the value of their telephone service and add to your revenue.

Teletalk systems give instant voice-to-voice contact with every department of a business. They are easy to install, take their power from the light circuit, require little service.

Now is the time to acquaint your subscribers with the time and energy saving that Teletalk provides. Let us send you full information on its profit-making possibilities. Write us today.

Let's All Back the Attack
Buy Extra War Bonds

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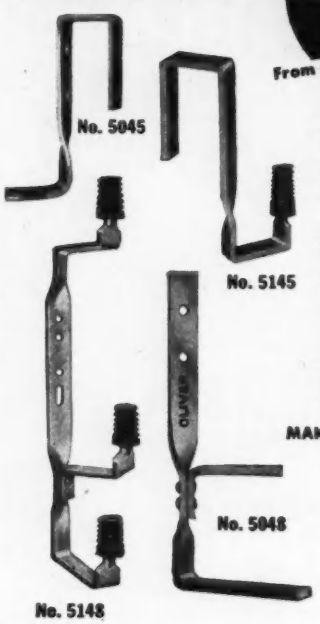
WEBSTER ELECTRIC

Racine, Wisconsin, U.S.A. • Established 1909 • Export Dept.: 13 E. 40th Street, New York (16), N. Y.. Cable Address "ARLAB" New York City

"Where Quality is a Responsibility and Fair Dealing an Obligation"

OLIVER TRANSPOSITION BRACKETS

From the complete line of Oliver Pole Line Material



Oliver makes a complete line of Transposition Brackets in sizes and types to suit the requirements of various systems. Several of the more popular styles are illustrated here. Designs are based upon standard practice of larger telephone, telegraph and railroad companies.

For complete information on these and other items, see the Oliver Catalog of Pole Line Materials.

MAKERS OF POLE LINE MATERIALS SINCE 1894

OLIVER
IRON AND STEEL
CORPORATION
SOUTH TENTH AND MURIEL STREETS
PITTSBURGH 5, PENNSYLVANIA

LEADING TELEPHONE COMPANIES STANDARDIZE ON

PENTA POLES

P & H PENTA

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"STILL IN THE LEAD"

Distributed by AUTOMATIC ELECTRIC SALES CORPORATION STROMBERG CARLSON COMPANY

WPB Issues Warning on Keeping Schedule A Data

The Communications Division of the War Production Board on February 19 issued an administrative letter, signed by Leighton H. Peebles, director, warning telephone companies that they must keep a record of applications of subscribers seeking service as Schedule A users as well as supporting data involving the granting of preferential treatment of subscribers under Schedule A of WPB order U-2. Following is the full text of the WPB administrative letter:

"In an administrative letter, dated July 10, 1944, your attention was directed, among other things, to the advisability of operating telephone companies keeping accurate and complete records of their actions on Schedule A applications for service. In accordance with our intentions, as stated in that letter, field inspections of various companies' records to Schedule A determinations have been made by division representatives, and will be continued from time to time. You are urged to continue to direct attention to the keeping of adequate records to support your actions involving the granting of preferential treatment pursuant to order U-2 to service applications.

"It has come to the attention of the Communications Division that in some instances applications, particularly for military personnel, have been accorded preferential treatment under order U-2 without the telephone companies' files containing adequate supporting information. Your records should contain adequate supporting information in respect to all applications granted preferential treatment, including those for military as well as civilian personnel. Responsibility rests with the telephone company for administering order U-2 rules giving preferred status to certain classes of applicants for service. If military or civilian representatives do not submit adequate supporting data, the telephone companies should not accord preferred status to their applications. Cases, where the military cannot submit satisfactory supporting information for secrecy reasons, may be referred to the War Production Board on appeal.

"From time to time complaints are made to the division that the present real user of telephone service is not a user contemplated in the service agreements. It is essential that all reasonable measures be taken by your company to insure that service is not continued for new users not qualified according to the requirements of order U-2. Your attention is directed to Paragraph (c) (1) of order U-2 which provides, 'Operators shall disconnect service when they learn that the present real user of service is not a user contemplated in the service agreements.'

"Your cooperation in the administration of order U-2 is sincerely appreciated. Please feel free to refer any problems to our attention which may require discussion or action by the War Production Board."

From Magneto To Dial

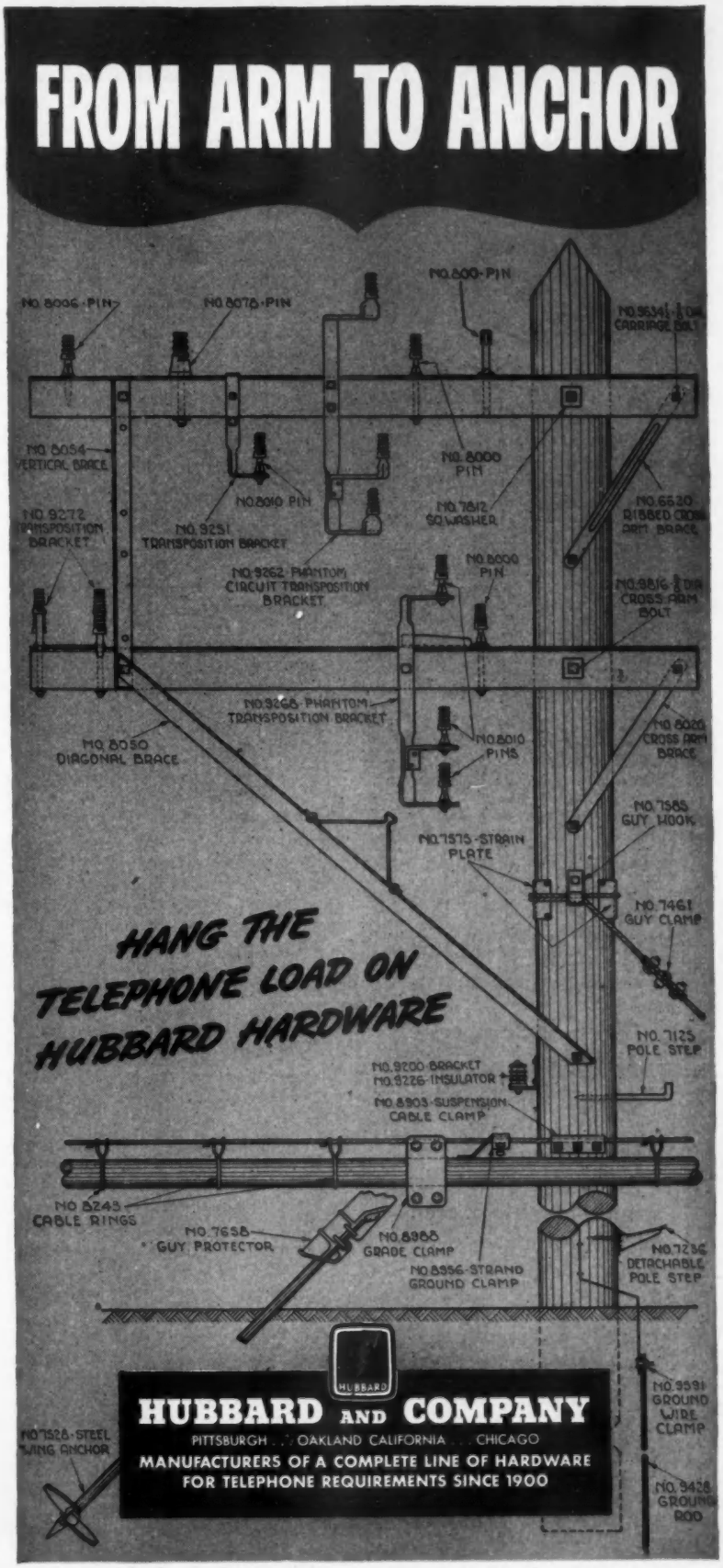
(Continued from page 20)

and new office, so the telephones would not be out very long when cut. About March 1 we started to cut-over the farm lines—one line at a time. We cut off the old telephones and then, if the line tested clear, we put in a new rebuilt common battery dial wall telephone with a listening key. Also, at this time we put in an approved outside lightning arrester on each telephone. Knowing the farmer-owned lines would not be satisfied to have their old magneto telephone cut-over to dial, we made a deal with them to give them just what we could get out of the old telephones, and we would rent them a new one at $2.00 per year in advance. We were to keep the telephones in repair when they were brought in to our office. So far this arrangement has worked out very satisfactorily.

After all the lines were cut-over, we were ready to cut in the attendant's cabinet at the home. This was done with the cooperation of the Northwestern Bell for they had to install equipment in our office, as well as their own in Valley City. This works out so that all non-collect in-calls are dialed to all our subscribers directly through Valley City at all times. In the day time we operate the attendant's cabinet and receive all out-calls through there, as well as all information. At night we cut-over the switch, and then all calls go through to Valley City from all subscribers in all exchanges. The Valley City lines have dual back dialing. This arrangement has speeded up our toll service, and provides much better talking quality on short haul toll.

Mrs. Brown and I are the commercial, traffic and plant departments in the two dial exchanges with an agent operator at our McHenry magneto exchange. That should put us in the class of a family-sized telephone company. We try to keep one outside man when we can get one, and need him badly. But every time I get a young fellow started, his number comes up, or some war plant takes him at higher wages than we can pay. The war must come first, regardless of what it does to us on the home front.

I stated that we had about 160 telephones in Cooperstown when we cut-over to dial. We now have about 220


FROM ARM TO ANCHOR
HANG THE TELEPHONE LOAD ON HUBBARD HARDWARE
NO. 8006 - PIN
NO. 8078 - PIN
NO. 8000 - PIN
NO. 8054 VERTICAL BRACE
NO. 8000 PIN
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NO. 7812 SQ WASHER
NO. 9272 TRANSPOSITION BRACKET
NO. 9251 TRANSPOSITION BRACKET
NO. 9262 PHANTOM CIRCUIT TRANSPOSITION BRACKET
NO. 8000 PIN
NO. 8050 DIAGONAL BRACE
NO. 9268 PHANTOM TRANSPOSITION BRACKET
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NO. 7125 POLE STEP
NO. 9200 BRACKET
NO. 9226 - INSULATOR
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NO. 8248 CABLE RINGS
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ALL the strength and durability inherent in steel are combined—with definite economies—in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

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Large proof reading staffs — suitable equipment — complete shipping facilities.

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CHICAGO, ILL.
WITH CONVENIENT PLANTS
NEW YORK PHILADELPHIA
MILWAUKEE

Answers to Traffic Questions on Page 28

(1) Changing the connection is not contemplated as a regular practice, but if a customer questions the accuracy of a don't answer condition or if from your experience you doubt it, you may change the connection and advise the calling party that you will make another attempt to reach the desired number.

(2) When an operator has a through connection established and she receives a signal and a request to ring another station, she asks the question, "Who are you?" to determine which operator is passing the order.

(3) If the traffic load is sufficient to warrant having the supervisor assume an operator's responsibility, it is advisable to have the chief operator or another supervisor assume her responsibilities while she is working at the switchboard. It would hardly seem possible for a supervisor to watch the movement of traffic, assist the operators, deal with customers, etc., while working at the switchboard in an operator's capacity.

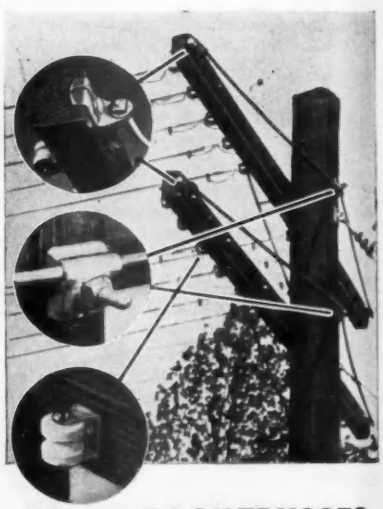
(4) Say, for example, "I don't know the name," and, if you know the number, add, "The number is (number)."

(5) Make the necessary explanation; that the call was for anyone and that conversation has taken place on the call.

in the city, with 30 of these working two-party divided ringing residence telephones. These work out about as well as single party lines, and each party has 12 hours a day to use their telephone. We try to put parties on the same line who do not know each other, as that saves revertive calls between the parties on the line. We had about 40 owned rural stations when we cut-over and now have about 65 stations. We have 16 code ringing. The farmer-owned lines had about 60 stations when we cut-over, and now have about 85 stations. We have back orders for 10 telephones of all classes.

Some of you might ask if converting to dial operation pays. If your problems are like ours you have our answer. And I want to say that our territory has not had any war plants of any kind and many of our people moved to enter war work. North Dakota has been blessed with several good crops and good prices for their products, which can best be indicated by the fact that the three banks in our county of 20 townships have about $3,000,000 of deposits today, while about 10 years ago the same deposits were less than $500,000. And our people have gone over the top on all war bond drives. We all might ask how our present condition will change after the war. I personally cannot help but think back to the period of 1932 to 1938 and hope we can keep our house in order. From our experience almost any telephone man can take care of a dial system and keep it working, for most of your troubles in the equipment for some years will be minor, and the several manufacturers that make and sell dial equipment will assist in every way they can, even to sending out a trouble man to go over your equipment when necessary.

In our case we had expected our son, Gordon, to keep up our equipment. But he was called into active service with the Army Signal Corps in July, 1942, only a couple of months after our



Chance BACK TRUSSES relieve cross arm strain Chance back trusses and terminal brackets put the dead-end load where it belongs and add years to the life of cross arms. Lines dead-ended on pins exert a heavy twisting strain on the arm and in a surprisingly short time the arm has to be replaced. With the Chance back truss method lines are dead-ended on terminal brackets mounted on the face of the arm. The load is evenly distributed and pulls directly against the steel truss. Most of the installation job can be done on the ground.

Once you have used this method you will use nothing else. Write for complete details.

A·B·CHANCE CO. CENTRALIA MISSOURI

Cooperstown exchange was cut-over. Since then it has been up to me to carry on, and from what he knows about dial equipment any telephone man will get along all right, if his outside plant is kept in fairly good condition, with trees trimmed and all connections properly sleeved. When you put 46 to 54 volts on your lines it is looking at all times for a chance to sneak its way to ground, and it will get there and cause trouble unless you are watching. With outside weather conditions as they are in North Dakota and Minnesota, you will find more trouble in outside plant than in the equipment. A good hand test set and an ohmmeter are good pals in helping keep your trouble down.

As I stated before, all of our farm lines are ground lines, and our next big problem is REA. They have signed up about 90 per cent of the farmers in our territory for electric service, and they have been assured that as soon as material is available it will come through. Personally, we think it is a fine thing, have signed up for it, and I think we all agree that they have a perfect right to come in and use our highways. The cost to sign up is $6.50, and a contract to use so much current the first 12 months after installed. That is the farmers' contract, but before they can have any current, they must invest from $200 to $400 in wiring their buildings. Also they promise further to repay all costs over a period of years. Some difference from the small installation charge of putting in a telephone, at least from what I know. But the point I want to bring out is that our lines will all have to be made metallic. In our state the public service commission has ruled that the REA shall furnish all material to make these lines metallic, while the telephone company does the work. That is fine, but I understand the REA has no money for this or will not use any money for it, so it will be up to our customers or prospective customers to pay for this material. That in a sort of a way makes them part owners in the lines they helped change over.

We all know that the cost to keep up these lines with a two-wire system will be considerably more than a one-wire system at all times, even after rebuilding. I am wondering if it would not be better in the long run to do this rebuilding with our own funds and then ask for a metallic line rate big enough to cover this so it will also pay us out in full over a period of years, and allow a small return to our stockholders. I do not have the answer, but maybe some one has.

OBITUARIES

GEORGE J. PETTY, San Francisco, Calif., retired vice president and treasurer of the Pacific Telephone & Telegraph Co., died February 4 following a serious operation at St. Joseph's Hospital.

Mr. Petty had been with the Pacific company for almost 50 years when he retired 13 years ago.

He is survived by his widow, a daughter and two grandchildren.

* * *

MILTON LLOYD HITE, 58, vice president and plant manager of the Farmers Mutual Telephone System, Edinburg, Va., died February 9 in Cora Miller Memorial Hospital, Woodstock, Va., where he had been a patient for the past month.

Mr. Hite had been connected with Farmers Mutual Telephone System since he was 16 years old. His father was one of the organizers of the first telephone line in Shenandoah County, and became the company's first president.

He is survived by his widow; two daughters, Mrs. Hilda Hite Cover, Winchester, and Miss Anna Lee Hite,

HELP WANTED—MALE—Con.

LAUNDRY Help—Men to weigh bundles, and miscellaneous; experience not necessary; steady job. Baska Laundry Co., 565 S. 10th, Kansas City, Kansas.

MACHINISTS—General machine operators: male, female, night, day, to operate turret lathes, engine lathes, milling machines, etc.; statement of availability or referral card from U. S. E. S. required. Apply Commonwealth Aircraft, Inc., Fairfax Airport, Kansas City, Kas.

MAGAZINE and Book ... deal; pay ... Mr. Bus...

HELP WANTED—MALE—Con.

MEN — Day or night work in our mill plant; we will train you for permanent post-war work. Apply Borden's Milk & Ice Cream Co., 3105 Gillham road. We are an essential industry.

MEN who are exempt from ... ment with large ... cern; between ... salary ...

MEN—White or colored, to clean factory floors; 40-hour week good pay; do not apply unless dependable. Apply to Mr. Ford, 5th floor, Brand & Puritz, 819 Broadway.

METAL Men—We need 3 metal men at once; good wages. BE. 3395.

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Hampton; two sons, Joseph Edwin Hite, Edinburg, and T/Sgt. Richard L. Hite of the United States Army in France.

Surviving also are a brother and three grandchildren.

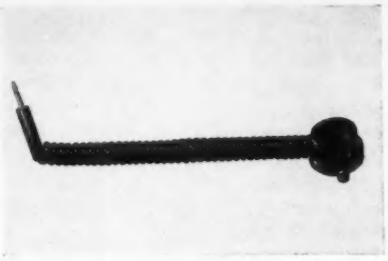
V V

Koiled Kords Adopted in Navy Cockpit Specifications

Another branch of the U. S. armed forces has recently incorporated the spirally molded rubber-jacketed electrical "Koiled Kord" into airplane accessories specifications. This product of the Kellogg Switchboard & Supply Co., provides the simplest and most practical means to stretch a cord to any desired distance and have it retract itself, out of the way, to its original spiraled length, it is said. It is a rubber covered electrical cord of one or more copper conductors and, because it is permanently molded by a vulcanizing process into the spiral shape, its smooth and positive expanding and contracting action is secured without the aid of springs, rubber bands or other mechanical means.

The Bureau of Aeronautics, Navy Department, has specified the use of the cords in Navy plane cockpits. The illustration pictures a three-conductor Koiled Kord attached to a microphone and a switchboard-type plug. It may be used for both radio and interplane telephone communications.

The readiness with which the armed forces have adapted the Koiled Kords



Kellogg Koiled Kords

to many wartime applications has started considerable thinking on the part of various manufacturers regarding the possibility of postwar adaptation of this spirally molded rubber-jacketed cord to commercial and industrial electrical equipment and to household electrical products.

Koiled Kords have been used by the telephone industry for a number of years on commercial telephone instruments, it is reported. Its use includes electric soldering iron cords, electric flat iron cords, etc. Different conductor combinations and diameters are available now on priorities for many different applications, and it is expected that its general use will be widespread after the war as standard equipment for the majority of electrical appliance products.

V V

Micka New Sales Representative For Stromberg-Carlson

Frank J. Micka recently was appointed telephone representative to cover parts of Ohio and West Virginia for Stromberg-Carlson Co., according to Ralph H. Barger, telephone sales manager.

FRANK J. MICKA

Mr. Micka has been connected with Stromberg-Carlson Co. as a member of the installation department for the past 4½ years. Previous connections prior to 1940 include 15 years with American Telephone & Telegraph Co. and Western Electric Co.—holding various positions in the engineering, plant maintenance and installation departments and traveling in the United States, Canada and Alaska.

Prior to and following his graduation from Oregon Institute of Technology, Mr. Micka has made his home in the Chicago area. However, he is planning to establish residence in his new territory.

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WANTED: Telephone plant accountant with sound bookkeeping and accounting background, free from draft. Permanent position. Give complete experience and salary expected. Write Community Telephone Co. of Wisconsin, Black River Falls, Wis.

WANTED: Telephone Accountant—qualified to supervise all phases of telephone accounting for Class A companies. Give full information as to age, experience, draft status, etc. Attach small photograph. Write Telephone Services, Inc., 16th Floor, Lincoln Tower, Fort Wayne, Indiana.

WANTED: Lineman, Troubleman for Magneto Exchange, 350 telephones, near Niagara Falls. Congeniality, reliability, cooperative desired. Good town, bus line, heated flat with bath and electricity available. Suitable for man and wife if desired. Good job and good location. Write Box 6, Sanborn, N. Y.

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WANTED: A Chief Operator by a telephone company in the middlewest with an extensive toll system. Good salary. Furnish full details as to age, experience, etc. Write Box 2145, c/o TELEPHONY.

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FOR SALE: Magneto telephone exchange of 395 owned stations, 152 switchers located in Northwest Missouri. A town of 1,000 population in a prosperous agricultural community. Gross revenue for 1944 was $14,758.57; this is exclusive of federal and state taxes. Selling to dissolve partnership. Great opportunity for live telephone man. Write Dorsey Telo. Co., Box 26, Braymer, Mo.

FOR SALE: Telephone exchange with over $4,000 annual revenue at $1,000 down, balance payable $60 per month for eight years. This includes interest. Write F. K. Noel, Grainfield, Kan.

FOR SALE: Wire Chief Desk Type Test Board completely equipped, 50,000 Ohm Volt Meter, all Keys; in combination with Western Electric Toll Test Panel. Write Appanoose County Telephone Co., Centerville, Iowa.

Mutual Line Incorporated

The Potter (Neb.) Mutual Telephone Lines are being incorporated by A. M. Leafdale, president; Donald E. Erickson, secretary-treasurer, and Theodore Carlson, Ernest Baach and William Benish as directors. The company, a non-profit corporation, will take over the lines running out of Potter, formerly owned by the North Potter Telephone Line Co., and its seven rural lines will be switched by the Northwestern Bell Telephone Co. exchange at Potter.

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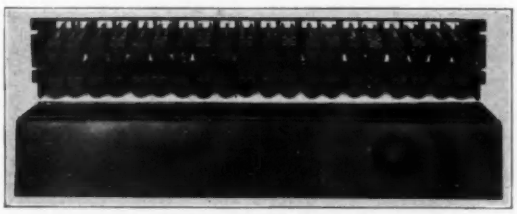

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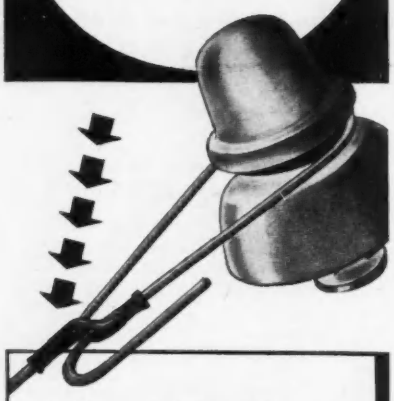

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